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ACCEPTANCE

This dissertation, THE RELATIONSHIPS AMONG EMOTION REGULATION, EXECUTIVE FUNCTIONING, COPING RESOURCES, AND SYMPTOMATOLOGY RESULTING FROM A TRAUMATIC EVENT, by REBECCA A.C. BLOOD, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree Doctor of Philosophy in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chair, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The Dean of the College of Education concurs.

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ABSTRACT

THE RELATIONSHIPS AMONG SELF-REGULATION, EXECUTIVE FUNCTIONING, COPING RESOURCES, AND SYMPTOMATOLOGY RESULTING FROM A TRAUMATIC EVENT
by
Rebecca A. C. Blood

Traumatic events have the capability to alter people's psychological, biological, and social functioning to a significant degree (van der Kolk & McFarlane, 1996). As a result, there has been a growing need to develop increasingly more sophisticated models to understand the complexities of people's responses to trauma (Luxenberg & Levin, 2004). Undergraduate students (N = 391) completed surveys designed to measure past trauma, trauma-related symptoms, self-regulation, executive functioning, and coping abilities. Participants completed a demographic questionnaire, a modified version of the Early Trauma Inventory Self-Report – Short Form (ETISR-SF; Bremner, Vermetten, & Masure, 2000), the Trauma Symptom Inventory – Alternate Form (TSI-A; Briere, 1995), the Dysexecutive Questionnaire (DEX; Wilson, Alderman, Burgess, Emslie, & Evans, 1996), the Self-Regulation Questionnaire (SRQ; Brown, Miller, & Lawendowski, 1999), and the Coping Resources Inventory for Stress – Short Form (CRIS-SF; Curlette & Matheny, 2008). Structural equation modeling (SEM) was utilized to simultaneously assess the relationships between variables. On average, participants reported experiencing 2.5 non-interpersonal traumatic events and 3.5 interpersonal traumatic events. Results revealed that overall, self-regulation, executive functioning, and tension control were important mediating variables in the relation between experiencing a trauma and resulting symptoms. Implications for clinicians working with individuals who experienced trauma and implications for future research are discussed.

THE RELATIONSHIPS AMONG SELF-REGULATION, EXECUTIVE FUNCTIONING, COPING RESOURCES AND SYMPTOMATOLOGY RESULTING FROM A TRAUMATIC EVENT

by
Rebecca A.C. Blood

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CHAPTER 1

SELF-REGULATION AND TRAUMA: IMPLICATIONS FOR CLINICIANS

The purpose of the present paper is to review of the extant literature on self-regulation and traumatic experiences. The goal of the present paper is to explore the nature of self-regulation, the current understanding of the role of self-regulation in regards to trauma, and the gaps in our current knowledge of self-regulatory deficits resulting from trauma. Possessing detailed knowledge of the ways in which self-regulation affects our clients who have experienced trauma is important in clinical practice and treatment. Practical implications for treatment of self-dysregulation in clinical settings are discussed throughout.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000), a traumatic event involves two parts: (1) experiencing, witnessing, or being confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of self or others; and (2) the person's response involves intense fear, helplessness, or horror. It is also possible for traumatic experiences to promptly generate heightened emotional and physiological responses (Tull, Barrett, McMillan, & Roemer, 2007), as well as self-regulation problems (Wild & Paivio, 2004). Problems with self-regulation often result in increased psychological distress and can interfere with recovery (Sigmon, Greene, Rohan, & Nichols, 1996). Understanding of self-regulation is even more critical with traumas associated with Complex Posttraumatic Stress Disorder (CPTSD; Herman, 1992) due to impairment of developmental processes related to the growth of self-regulation

(Cloitre, 2009). Providing clinicians with a better understanding of self-regulation would likely improve their ability to decrease problems related to self-regulation.

The diagnostic criteria for Posttraumatic Stress Disorder (PTSD) and Acute Stress Disorder (ASD) include symptoms of reexperiencing, avoidance of trauma-relevant stimuli and general numbing, and persistent hyperarousal (DSM-IV-TR, 2000). PTSD and ASD diagnoses differ in terms of the length of time that symptoms have been experienced. PTSD can only be diagnosed when one month has elapsed since the traumatic stressor, while ASD is diagnosed when two days to four weeks time has elapsed since the trauma. There are several associated features of PTSD and ASD that are acknowledged but not explicitly included as part of the diagnostic criteria. Associated features of PTSD may include dissociation, cognitive distortions, and identity and affect regulation (Briere & Scott, 2006). While the following discussion is not intended to focus solely on CPTSD or Disorders of Extreme Stress Not Otherwise Specified (DESNOS; Pelcovitz et al., 1997), much of the extant research is focused on CPTSD or DESNOS, as the criteria for Posttraumatic Stress Disorder (PTSD) and Acute Stress Disorder (ASD) do not include symptoms of self-dysregulation (DSM-IV-TR).

Defining trauma

The term “trauma” has many different meanings, often referring to medical or physical injury, psychological injury, or to events that cause the injury (Ford & Courtois, 2009). Due to multiple ways of defining trauma, it is often difficult to discern the intended meaning of the word referenced. Trauma can be used to refer to the traumatic stressor event or the individual’s response to the event (Ford & Courtois). For the purposes of this paper, the term trauma will refer to the traumatic stressor event, rather

than the individual's response to the event, as this is often the operationalized definition in many research studies (Friedman, Resick, & Keane, 2007; Norris & Slone, 2007). In the DSM-III and DSM-III-R, a trauma was defined as a stressor, thus suggesting the term trauma as an event rather than a reaction to an event (American Psychiatric Association, 1980; 1987).

There are many different types of traumatic events. There are several common forms of traumas, including but not limited to a car accident, natural disaster, a terrorist attack, war, or abuse. Typically, non-interpersonal traumas refer to car accidents, natural disasters, war, etc., while interpersonal traumas refer to emotional, physical, or sexual abuse. Emotional abuse is defined as an experience where someone overly criticized, focused on failures, yelled, screamed, and/or swore at another person (United States Department of Health and Human Services, 1989). Physical abuse refers to someone being punched, bitten, kicked, burned, or beaten, while sexual abuse refers to someone being fondled, feeling frightened when someone exposed him or herself, being sexually exploited, or having someone attempt unwanted sexual contact (US Dept. of Health).

Additionally, trauma is often defined as Type I or Type II trauma. Type I traumas are single-incident traumas (e.g., car accident, natural disaster, a single incident of abuse), while Type II traumas are complex or repetitive (e.g., ongoing abuse, war, or genocide; Ford & Courtois, 2009). Type II trauma (i.e., multiple trauma) is often referred to as complex trauma (Herman, 1992), revictimization (Briere & Spinazzola, 2009), and complex PTSD (Ford & Courtois, 2009). Unfortunately, when many studies use the term trauma they do not differentiate between Type I or Type II traumas. Furthermore, most research does not explicitly define the different types of interpersonal trauma. Given the

terms that are used interchangeably, as well as the ambiguity in definitions, it may be difficult for clinicians to fully understand or use the terminology consistently. This likely hinders the effectiveness of detailed treatment plans and may confuse clinicians when discussing client concerns. Additionally, it has been posited that the diagnostic criteria of PTSD captures only a limited aspect of posttraumatic psychopathology (Briere, 1988; Friedman et al., 2007; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005; Vogt, King, & King, 2007). Therefore, individuals who experience trauma may suffer from resulting dysfunction but may not meet the criteria for PTSD. Alternatively, individuals who experience trauma may meet the criteria for PTSD but may also experience a number of other symptoms, including self-dysregulation, in addition to PTSD symptoms. These challenges highlight the ongoing debate between the diagnoses and symptoms of ASD, PTSD, and CPTSD.

Defining self-regulation

Self-regulation is an innate human quality that is defined in a variety of ways. A broad definition would be that self-regulation speaks to the ability to monitor and modulate cognition, emotion, and behavior, to accomplish one's goal and/or to adapt to the cognitive and social demands of specific situations (Berger, Kofman, Livneh, & Henik, 2007). Self-regulation has also been described as self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals (Zimmerman, 1999). Since the term self-regulation encompasses several different systems within the body, the term emotion regulation is utilized when focus is placed solely on the emotional component. Emotion regulation is defined as the ability to

experience, express, and modulate core emotional states (Ford, 2009). In other words, the inability to control emotional states is defined as emotion dysregulation.

Again though, many terms are used interchangeably to describe emotion regulation (e.g., affect, reflex, mood, impulse, feeling; Gross & Thompson, 2006). According to Gross and Thompson, affect is used as the superordinate category for different states that involve immediate good-bad discriminations. Affective states can include general stress responses, emotions such as anger or sadness, moods such as depression, and other motivational impulses such as those related to eating, aggression, sex, or pain. In other words, affect regulation includes the constructs of coping, emotion regulation, mood regulation, and psychological defenses (Gross & Thompson). As mentioned above, stress typically produces affective responses (e.g., anger or sadness), while emotion usually refers to both negative and positive affective states (e.g., happiness and sadness; Lazarus, 1993). Affect regulation refers to an individual's ability to tolerate painful internal states and to effectively modulate affect (Briere & Scott, 2006). While cognitive, behavioral and emotional skills all appear relevant to the trauma response, the affective reaction is most studied (Koenen, 2006).

It is posited that cognitive constructs are involved in the functioning of the emotion regulation system (Koenen, 2006; Ochsner & Gross, 2005). Experiencing emotional states such as anger, sadness, and love involves areas of the brainstem (medulla, pons, midbrain, locus coeruleus) that activate the body by producing neurotransmitters (Bracha, 2008, as cited in Ford, 2009). Expressing emotions and action (e.g., aggression, reward seeking) involves striatal brain areas (putamen, caudate, nucleus accumbens) that are activated by the cortex and selectively alter sensory perception and

intentional behavior (Heim & Nemeroff, 2001, as cited in Ford, 2009). Modulation of emotional states mainly involves the limbic system (Milad et al., 2007, as cited in Ford, 2009). Thus, deficits in emotion regulation appear to be mediated by the connections between the frontal brain and limbic systems (Koenen, 2006). While it seems we comprehend many of the cognitive aspects of emotion regulation, less is understood about the specific ways that self-regulation (i.e., emotion regulation) interacts with trauma.

Relationship between self-regulation and trauma

In the context of child abuse, Herman (1992) discussed the resulting impact of this type of trauma on the body. Herman suggests that the normal regulation of bodily states (i.e., self-regulation) is disrupted by the effects of the trauma. Additionally, the disturbance of emotional states is also highlighted, as trauma often evokes repeated, intense negative reactions that cannot be soothed using ordinary means (Herman). While self-dysregulation is discussed as a result of repeated and prolonged exposure to trauma, it is not necessarily indicated as a consequence of PTSD. In fact, Herman identified a need for more accurate diagnosis than PTSD and at that time, proposed the term "complex post-traumatic stress disorder" (p. 119). As a result of exposure to insurmountable obstacles, children may not have the opportunity to develop intact affect regulation skills. This may impact individuals' trajectory into adulthood, as the formerly abused adult may be subject to affect instability, problems with affect inhibition, and difficulty modulating dysphoric states (Briere, 2002).

Although theoretical literature has noted the relationship between self-regulation and trauma (Allen, 2001; Briere & Scott, 2006; Herman, 1992), most empirical research

has focused on the association between self-regulation and only trauma-related symptomatology (Bornovalova, Fishman, Strong, Kruglanski, & Lejuez, 2007; Briere, Kaltman, & Green, 2008; Briere & Rickards, 2007; Cloitre et al. 2009; Tull et al., 2007). An examination of the literature on this topic has highlighted the difficulties in comparing trauma research (Keane, Brief, Pratt, & Miller, 2007). As stated above, the various articles differ from one another in their definition of trauma, as well as their measurement and assessment of trauma (Norris & Slone, 2007). There are very few research articles examining any type of relationship between self-regulation and trauma (i.e., experiencing a traumatic event), as this has been more of a recent shift in direction within the field of trauma (Koenen, 2006; van der Kolk et al., 2005; van Dijke, 2008). Furthermore, the role of self-regulation within the field of trauma has been emphasized as a key developmental process that should be considered (Koenen). The most applicable articles that examine the relationship between self-regulation and trauma are reviewed below.

In an article that sought to explain Disorders of Extreme Stress (DESNOS), van der Kolk et al. (2005) examined the effects of prolonged interpersonal trauma. This article provided a strong argument for the inclusion of DESNOS in the *DSM-IV*. Since DESNOS addresses self-regulation and dissociation issues when PTSD fails to address these concepts, attention directed toward this construct is of paramount importance. The authors suggested that the focus of trauma research needs to extend beyond traditional PTSD. Specifically, these researchers emphasized the importance of capturing the multidimensional nature of the effects of trauma and requested future researchers to

examine other psychological domains such as perception, affect regulation, and impulse control.

Using participants from the *DSM-IV* field trial for PTSD, a total of 400 adults and adolescents (age 15 or older) were selected. Participants were recruited from several outpatient mental health treatment sites that specialized in treating effects from trauma. The High Magnitude Stressor Events Structured Interview (Kilpatrick et al., 1998, as cited in van der Kolk et al., 2005) was used to screen for lifetime history of high-magnitude events. PTSD was assessed using the Diagnostic Interview Schedule (DIS) and the Structured Clinical Interview for DSM-III (SCID-PTSD).

van der Kolk et al. (2005) established two groups to discriminate between age of onset and nature of traumatic experience. This decision underscores the importance of differentiating between interpersonal trauma and non-interpersonal trauma, as these often have very different effects. After grouping the data, highly significant differences in posttraumatic symptoms were found between the Early Onset and Late Onset Interpersonal abuse groups. Also, van der Kolk et al. discovered a trend between the diagnoses of lifetime PTSD and DESNOS and duration of the trauma. These results suggest that length of exposure to traumatic events is related to the development of PTSD and/or DESNOS.

Frewen and Lanius (2006) proposed a psychobiological model that views PTSD primarily as a disorder of affect arousal regulation. The authors argued that individuals with PTSD are unable to down regulate or up regulate his or her level of arousal. In other words, an individual who cannot down regulate his or her level of arousal would have problems with managing aversive arousal and distress. Relatedly, an individual who

cannot up regulate his or her level of arousal would likely experience emotional numbness. This suggests that individuals with PTSD experience a generalized lack of control over their emotional responding and lack the ability to adaptively regulate levels of affective arousal in the context of stressors. The article reviewed the results of several neuroimaging studies of emotion regulation and applied the proposed psychobiological model to these results.

Based on the neuroimaging results, Frewen and Lanius (2006) concluded that PTSD can result in a generalized deficit of emotion regulation and often encompasses a variety of complex negative affective states. Furthermore, the authors suggested that these results often occur from long-term exposure to traumatic events, rather than single incident traumas. Results indicated that the current PTSD diagnosis may not entirely assess all forms of affective disturbance (e.g., dissociation, self-dysregulation, etc.) that may also be critical to the overall understanding of the disorder.

Both van der Kolk et al. (2005) and Frewen and Lanius (2006) argue that the current PTSD diagnosis does not fully assess all problems that may be related to experiencing a trauma. Furthermore, without a comprehensive assessment measure, clinicians are expected to recognize the multidimensional nature of trauma and/or PTSD, as well as adhering to the traditional guidelines of a DSM-IV-TR diagnosis. This presents a challenge for clinicians since the criteria in the DSM-IV-TR provide clinicians with a standard for diagnoses. A lack of adherence to the standard criteria poses a problem for clinicians in terms of treatment, as well as reliability and consistency. These challenges will be explained in greater detail in the treatment section of this article.

Tull et al. (2007) examined the relationship between posttraumatic stress symptoms (PTS) and several aspects of emotion regulation difficulties among 194 undergraduate college students who experienced trauma. It should be noted that Tull and colleagues investigated PTS in addition to PTSD, as these are not the same construct. As discussed previously, it is possible for individuals to experience PTS (i.e., symptoms resulting from trauma) and not meet the diagnostic criteria for PTSD (Briere, 1988; Friedman et al., 2007; van der Kolk at al., 2005; Vogt et al., 2007).

The Traumatic Events Questionnaire (TEQ) was used to assess traumatic event exposure, while the PTSD Checklist (PCL) measured the severity of symptoms experienced as a result of a stressful live event. To assess emotion regulation, the Difficulties in Emotion Regulation Scale (DERS) was utilized. DERS is a 36-item measure that assesses typical levels of difficulties in emotion regulation (Gratz & Roemer, 2004). Participants rated each item based upon the way they respond to uncomfortable emotional experiences. Tull et al. (2007) did not provide any sample items from the measure. DERS has been found to have adequate construct and predictive validity and had good test-retest reliability (Gratz & Roemer).

Results suggested that PTS was significantly positively associated with problems related to emotion regulation (Tull et al., 2007). Furthermore, a multivariate analysis of variance (MANOVA) indicated that individuals who exhibited PTS symptoms at a level consistent with a diagnosis of PTSD reported significantly higher levels of problems related to emotion regulation than those who did not meet the threshold for a diagnosis of PTSD. The researchers emphasized the preliminary nature of these results, as they suggested that multimodal assessment of emotional responses be applied. Specifically,

the use of emotional responses and regulatory efforts using laboratory tasks and psychophysiological measurements may lead to a more thorough investigation. Employing multiple measures of emotion regulation assessment may result in a clearer understanding of how trauma-exposed individuals regulate their emotion.

There were several limitations to the aforementioned study. Severity of trauma and frequency of trauma were not assessed. Assessing severity and frequency of trauma are considered to be critical components of accurately measuring traumatic exposure (Keane et al., 2007). Additionally, the trauma measure that was used to assess traumatic event exposure did not specifically assess fear, helplessness, or horror in response to the traumatic events. As previously noted, a feeling of fear, helplessness, or horror is part of the criteria of a traumatic event (DSM-IV-TR, 2000). These limitations speak to inherent problems with most traumatic event assessments (Norris & Slone, 2007). Without these components, it seems difficult to draw conclusions regarding the effect of a traumatic event, particularly in relation to emotion regulation.

Amstadter and Vernon (2008) investigated the association between thought suppression, emotion regulation, and coping strategies in a group of 65 trauma-exposed undergraduate college students. Within this group of trauma-exposed students, 31 individuals met the criteria for a diagnosis of PTSD, while 34 individuals comprised a group of non-PTSD participants. The researchers used the Emotion Regulation Questionnaire (ERQ) to assess emotion suppression and emotion reappraisal. The ERQ (Gross & John, 2003) consists of six items assessing emotion reappraisal (e.g., “I control my emotions by changing the way I think about the situation I am in”) and five items concerning emotion suppression (e.g., “I control my emotions by not expressing them”).

Cronbach's alpha coefficients in the study were consistent with previous findings (Reappraisal, α = .81; and Suppression, α = .75). Coping styles were measured using the Coping Strategies Inventory (CSI; Tobin et al., 1989). Exposure to traumatic events was assessed using the Life Events Checklist (LEC; Blake et al., 1995) and the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993). Results indicated that the use of thought suppression, emotion suppression, and avoidant coping strategies was positively related to PTSD (Amstadter & Vernon, 2008). The researchers cited this article as the first study to include all three categories of modulation in the same trauma sample. Due to the correlational and cross-sectional design of the study, less is known about the interactions or any causal effects among these very important variables.

A study examining DESNOS symptoms was completed with a group of 345 sophomore college women (Ford, Stockton, Kaltman, & Green, 2006). Of the participant sample, 84% of the women had experienced at least one traumatic event. Based on previous studies investigating trauma symptomatology, the researchers highlighted the difference between DESNOS symptoms and PTSD symptoms. PTSD symptoms typically include unwanted memories, excess arousal, and conscious and automatic attempts to cope with the memories and excess arousal. The researchers sought to examine DESNOS symptoms which include a broader set of self-regulatory problems. This was the first study to assess DESNOS using a healthy young adult population.

Ford et al. (2006) used the SIDES (Pelcovitz et al., 1997) to assess the presence of 48 symptoms that are related to DESNOS features. The SIDES consists of seven subscales that correspond to the seven aspects of DESNOS. Specifically, DESNOS involves persistent alterations in the following areas of self-regulation and psychosocial

functioning subsequent to trauma exposure: (a) affect and impulse regulation, (b) biological self-regulation, (c) attention of consciousness, (d) perception of perpetrator(s), (e) self-perception, (f) relationships, and (g) systems of meaning or sustaining beliefs (Ford et al.). Pelcovitz et al. reported adequate internal consistency for the SIDES total score and subscale scores.

Per existing literature (e.g., van der Kolk et al. 2005), Ford et al. (2006) separated participant data based on the severity or frequency of their trauma. There were five groups examined that consisted of no trauma, single-incident noninterpersonal, single-incident interpersonal, multiple interpersonal trauma (i.e., multiple assaults, multiple physical or sexual abuse incidents, with one perpetrator), and cumulative abuse trauma subgroups (i.e., multiple incidents with more than one perpetrator). Interestingly, affect dysregulation was the least commonly endorsed SIDES feature (Ford et al.). However, at least 80% of participants demonstrated a correspondence between lifetime PTSD and three DESNOS features (i.e., affect dysregulation, somatization, and altered self-perceptions). In other words, the most prevalent DESNOS features occurred in the absence of PTSD. Although affect dysregulation was the least frequently reported DESNOS feature overall, the highest levels of affect dysregulation occurred in the cumulative abuse trauma subgroup.

An analysis of covariance (ANCOVA) compared the five trauma groups on the number of DESNOS symptoms while controlling for the presence of a lifetime PTSD or other Axis I disorder (i.e., depression, anxiety, etc.). Results from the ANCOVA indicated that participants who experienced childhood or adolescent trauma suffered from complex posttraumatic biopsychosocial dysregulation (i.e., DESNOS features) that was

independent of PTSD or another Axis I psychiatric disorder (Ford et al., 2006). This study extended previous findings by suggesting that self-dysregulation may be present even among women who have reportedly sufficient resources or coping skills.

Following a thorough search of psychology article databases (i.e., PsycINFO, PsycARTICLES), the aforementioned studies appeared to be the only relevant research articles examining self-regulation and trauma. As noted by van der Kolk (2006), the fields of psychology and psychiatry have narrowly focused on either neurochemistry or emotional states in relation to trauma and have paid little attention to the patterns of these two concepts simultaneously. Despite the limited research on this relationship, there is slightly more focus on the treatment of self-regulation in regard to trauma. The next section discusses treatment considerations in detail.

Treating self-dysregulation resulting from trauma

In order to discuss specific strategies for treating self-dysregulation, treatment recommendations for treating trauma must also be discussed. To date, there are no formal, published treatment guidelines for CPTSD (Courtois, Ford, & Cloitre, 2009), as this is not yet a clinical diagnosis (DSM-IV-TR, 2000). While there are multiple strategies for treating traditional PTSD, as stated earlier, an increase in self-dysregulation occurs most often with CPTSD. Given the symptom overlap of ASD, PTSD, and CPTSD, Courtois et al. and Herman (1992) recommend that all treatment should begin with several basic concepts.

Prior to applying treatment techniques, a thorough and accurate assessment of trauma is recommended (Keane et al., 2007). There are a number of structured diagnostic interviews that are designed to assess a broad range of psychiatric conditions, including

PTSD (e.g., SCID-IV, CAPS, PSS-I). While these assessments demonstrate good reliability and validity, they typically only assess symptoms related to the criteria of PTSD. The Clinician Administered PTSD Scale (CAPS; Blake et al., 1990) additionally measures associated symptoms of guilt and dissociation but does not include other symptoms of self-dysregulation. Of additional note, it is recommended that the assessment of psychological symptoms should occur in a dimensional nature rather than a dichotomous nature (Keane, Weathers, & Foa, 2000, as cited in Keane et al.; Ruscio, Ruscio, & Keane, 2002). In other words, frequency or severity of symptoms resulting from a trauma should also be assessed since higher levels of trauma often result in increased symptomatology. Perhaps the most accurate and thorough method of assessment would be to utilize a structured diagnostic interview but supplement this with measures of other symptomatology (i.e., features of self-dysregulation) that may also be important to be address during the course of treatment.

In this section, a case study will be used to illustrate the nature of therapy and treatment. Trauma specific treatment techniques will be first discussed and then applied to the case. To protect the identity of the client, the name and identifying information have been modified. A client, Nancy, self-identified as a 20-year-old White, heterosexual female who was enrolled at a local college. She recently had a late-term abortion and was presenting with several symptoms of PTSD, including associated features of PTSD.

In terms of treatment, the importance of recognizing the client as an individual and viewing the client in a holistic manner is emphasized (Courtois et al., 2009; Herman, 1992), as treatment of trauma cannot be viewed as one size fits all. There are many different variables related to the trauma (i.e., frequency, severity, symptoms, and distress)

that would fluctuate depending on the individual and his or her strengths, resources, resilience, and context (Courtois et al.). Throughout the treatment process, an egalitarian and collaborative view is emphasized. In addition, Courtois et al. suggest that a strength-based approach underscores the concept of empowerment. Since disempowerment and disconnection from others are core experiences of trauma (Herman), empowerment is a critical part of trauma-based therapy.

When Nancy first presented for counseling, she was asked to describe her experience to the best of her ability. Based on her self-reported history, it was determined that she was presenting with a single-incident non-interpersonal trauma. She denied a history of physical, sexual, or emotional abuse. Despite the simplicity of her trauma history, Nancy was displaying a number of symptoms related to PTSD including persistent reexperiencing of the event, avoidance of trauma-relevant stimuli, and increased arousal. Following the traumatic event, Nancy had been experiencing these symptoms for three months. She reported a lack of social support or familial support, as well as decreased coping resources.

According to Herman (1992), recovery takes place in three stages. This metamodel is widely used in treatment of traumatic stress and is organized to address specific issues and skills (Herman; Janet, 1889). This three phase model includes establishing safety, processing traumatic memories, and reintegration. While the model is typically organized in a somewhat linear progression, therapy may often resemble a non-linear process (Herman).

Within the first stage of this model, problems with self-regulation are typically addressed. The initial stage of safety and stabilization is the most important stage in the

process to recovery (Courtois et al., 2009). Herman (1992) indicated that this stage can take several months to many years depending on the nature, severity, and frequency of traumatic event exposure. One of the tasks that is critical to establishing safety is helping the client restore control. This includes addressing problems with self-regulation such as learning to manage emotional arousal, dissociation, re-experiencing, and numbing.

In Nancy's case, she was experiencing a number of problems related to self-regulation. She reported frequent crying spells (with no stimuli), nightmares, difficulty concentrating, and feeling numb. Also, Nancy was compulsively monitoring her food intake, as she was employing restrictive eating habits. Eating too much food caused Nancy to experience a small bulge in her abdominal area, which resulted in her fearing that she was pregnant again. Before addressing her trauma, it was critical to establish a supportive and trusting therapeutic relationship. Once this was established, we were able to progress and address her most basic needs. It seemed necessary to focus on Nancy's stabilization, particularly in terms of her controlled eating. Her body was not receiving the nutrients and calories it needed to function. Nancy was using eating as a means of control when in fact, she felt powerless and a complete loss of control (over her situation). According to Herman (1992), establishing safety begins by focusing on control of the body and gradually moving outward toward control of the environment. Once Nancy was able to slowly increase her food intake, she began to restore her perception of safety and power. She was able to apply this increased sense of control in the context of her life, thus beginning to reduce her other symptomatology. The therapist worked to clarify and validate Nancy's often confusing thoughts, emotions, and states of mind

associated with self-dysregulation. Assisting the client with self-regulation also helped her to tolerate self-awareness (Ford, Courtois, Steele, van der Hart, & Nijenhuis, 2005).

Phase two involves processing of traumatic memories, a stage that Herman (1992) refers to as remembrance and mourning. During this phase, narrative reconstruction of the trauma must be in depth and detailed (Courtois et al., 2009). Clients are encouraged to feel the emotions that are associated with the trauma. The goal is for the client to gain the ability to tolerate the memories and associated emotions, as well as to gain self-efficacy. Some clients may never reach this phase, as self-regulation is necessary to be able to tolerate the distress that this phase may produce. This phase applies the self-regulatory skills that are learned in the previous phase.

Nancy successfully re-gained control of her life and re-gained the ability to self-regulate. The skills were critical for phase two, as her symptoms abated. Despite these skills, for Nancy, this phase was particularly difficult. The traumatic memories that she contained created painful emotions for her. The idea of narrative reconstruction was discussed collaboratively with Nancy. She considered this idea for several sessions until one day, she walked into the office and acknowledged that she was eager and prepared to tell her story. It took considerable courage for Nancy to experience these emotions that were associated with the traumatic event. She gathered her strength, and bravely reconstructed her experience while the therapist was present to witness. Given the detailed and in depth nature of reconstruction, Nancy spent several sessions on her narrative. During this time, Nancy was also confronted with the task of grieving what was lost as a result of her difficult decision. The therapist provided Nancy with constant support, encouragement, and prompted her to apply techniques she learned in the

previous phase. There were times when Nancy was flooded with negative affect, but she was able to modulate her arousal using self-regulation techniques. Although Nancy's reconstruction of the trauma will never be entirely complete, it was clear that she was prepared to move into the next phase once she was able to reclaim her history and felt renewed hope and energy for re-engagement with her life (Herman, 1992).

Reintegration is the last phase of this metamodel. This phase may be viewed as a culmination of the therapeutic work but may be difficult for clients who have not had the opportunity for a life that is in the range of normal (Courtois et al., 2009). The focus of reintegration is unresolved developmental deficits and fixations, as well as finalizing self-regulatory skills. From the beginning of this stage, clients are ready to engage more actively in their world (Herman, 1992). Incorporating the lessons of the trauma and increasing control and power are goals of reintegration.

Upon reconstructing her narrative, Nancy described feeling a sense of freedom. She acknowledged continuing feelings of guilt, shame, and sadness, but she had the ability to experience these intense dysregulated feelings, impulses, and thoughts. Nancy asserted that she felt increased self-control, particularly in terms of her emotions, thoughts, goals, decisions, and actions. She focused on establishing relationships with others, while also concentrating on her own life and enjoyment. The future challenges that may arise as a result of this trauma were discussed with Nancy. She understood that posttraumatic distress associated with ordinary difficulties in her life would likely manifest in future relationships. Nancy felt equipped to confront these future challenges and felt confident in her own capacity and abilities.

While this case illustrated a woman presenting with a single-incident non-interpersonal trauma, one can imagine the complexity of treating a client with a cumulative trauma history. Even though single-incident non-interpersonal traumas are not typically associated with CPTSD symptoms (Ford et al., 2006), it seems that Nancy was indeed experiencing self-dysregulation in addition to meeting the diagnostic criteria for PTSD. This case demonstrated the detailed nature of treating individuals with trauma histories, as well as the uniqueness of trauma.

Conclusions

Given the prevalence of trauma in the general population, it seems imperative for clinicians to have an understanding of the treatment for such individuals. There seem to be several flaws in the areas of trauma research and treatment, as there continues to be a disparity between these two areas. Presently, the existing empirical literature focuses on PTSD, while neglecting the associated features related to self-dysregulation (van der Kolk et al., 2005; Vogt et al., 2007). While theoretical literature discusses and addresses problems of self-dysregulation, there is still much to understand about the relationship between trauma and self-dysregulation, as self-dysregulation is often a concept that is investigated from a biological point (Koenen, 2006). Additionally, there are likely many clients who present with symptoms of trauma but do not meet the diagnostic criteria for PTSD. Since the majority of the research is conducted with individuals who meet the diagnostic criteria for PTSD, less is understood about the interactions between trauma (i.e., experiencing a traumatic event), resulting symptomatology, and self-dysregulation. There is a need for these concepts to be clarified in research, so that clinicians may treat individuals presenting with trauma more effectively.

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CHAPTER 2

THE RELATIONSHIP BETWEEN EMOTION REGULATION, EXECUTIVE FUNCTIONING, COPING RESOURCES, AND TRAUMATIC SYMPTOMS RESULTING FROM A TRAUMATIC EVENT

Introduction

Traumatic events have been defined by the existence of stressors that have resulted in differential effects on organismic functioning (Wilson, 2004). Traumatic events have the capability to alter people's psychological, biological, and social functioning to a significant degree (van der Kolk & McFarlane, 1996). While there is extensive research examining the effects of trauma on psychological functioning (Briere, 2006; Cloitre, 2009), less is known about the effects of trauma on the interacting mechanisms of an individual's biological and social functioning (Wilson, 2004). Specifically, experiencing a traumatic event, seems to frequently result in an impairment of self-regulation and executive functioning (van der Kolk, 2004), while coping resources may mediate resulting symptomatology (Sharkansky et al., 2000).

Most people who are exposed to a traumatic event do not develop persistent post-traumatic stress disorder (PTSD; Friedman, Resick, & Keane, 2007). Surveys suggest that as many as 39% to 75% of people in the general population have experienced at least one major traumatic stressor in their lifetime (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Breslau et al. (1991, as cited in Keane & Kaloupek, 2002) indicate that approximately 25% of those exposed to a traumatic event ultimately developed PTSD. PTSD has been described as a psychobiological state or dysregulated system whose expressions are biobehavioral, internal, and external in nature (Wilson, 2004). In other words, PTSD is a dynamic and multidimensional reaction to stress (i.e., traumatic event).

When discussing trauma, it is important to identify and define this term, as there are different types of trauma. According to Briere (2004), a subset of potentially traumatic events is regularly cited in the literature as producing posttraumatic symptoms. These events can include disasters, war, motor vehicle accidents, rape, sexual assault, intimate partner violence, stalking, and child abuse. In addition to a large number of potentially traumatic events, the type of event (i.e., interpersonal or nonhuman) can determine the level of resulting dysregulation. For example, Briere and Elliott (2000), found that interpersonal trauma was associated with more symptomatology than was disaster exposure. Furthermore, trauma can also be defined as Type I or Type II trauma. Type I traumas are single-incident traumas such as a car accident, natural disaster, or a single incident of abuse, while Type II traumas are complex or repetitive (e.g., cumulative abuse, war, or genocide; Ford & Courtois, 2009). Type II trauma (i.e., multiple trauma) is frequently referred to as complex trauma (Herman, 1992), revictimization (Briere & Spinazzola, 2009), and complex PTSD (Ford & Courtois, 2009).

Although trauma may appear to be a relatively simple concept, it is a complex, multifaceted system. As a result, there has been a growing need to develop increasingly more sophisticated models of understand the complexities of people's responses to trauma (Luxenberg & Levin, 2004). In fact, the need for clarification of the psychological and physiological issues underlying PTSD was noted in 1984 (van der Kolk). While the field had advanced its understanding since that recommendation, there continues to be a lack of understanding from a psychobiological perspective, particularly

in regards to the continued interface of the biological and psychological correlates (Monson, Friedman, & La Bash, 2007).

The literature regarding traumatic event exposure in relation to self-regulation, coping strategies, executive functioning is reviewed below. In addition, the possibility of resulting symptomatology following the traumatic event will be discussed.

Self-regulation

Self-regulation has been defined as self-generated thoughts, feelings, and actions that are planned and adapted to the attainment of goals (Zimmerman, 1999). Most relevant to traumatic experiences are the emotion processing and executive functioning self-regulation systems (Koenen, 2006). Emotion regulation has generally been defined as processes that influence which emotions are expressed, when these are expressed, and how they are expressed (Bloch, Moran, & Kring, 2010).

More specifically, emotion dysregulation has been described to include the inability to regulate and modulate affective experience (Luxenberg & Levin, 2004; van Dijke, 2008). In other words, this inability may result in an individual being unaware of the affective experience as a result of being either being numb or overwhelmed. Emotion dysregulation may also include the incapacity to experience all aspects of affect and the inadequate communication of emotion (van Dijke, 2008).

Underregulation and overregulation of emotion have been identified as two manifestations of emotion dysregulation that are relevant to traumatic event exposure (van der Kolk et al., 1996). Underregulation of affect could be explained as being overaroused or overwhelmed by emotion and not being able to modulate these emotions

(van Dijke, 2008). Alternatively, overregulation of emotion could be described as the inability to tolerate or experience any emotion (van der Kolk & McFarlane, 1996).

Although emotion regulation has been highlighted as an essential role in the etiology of PTSD (Koenen, 2006), most trauma-related research has focused on understanding cognitions and behavior avoidance (van Dijke, 2008). Studies examining the role of coping resources in traumatic stress have become more common. However, more research is called for as to the interaction between emotion regulation and coping strategies (Lazarus, 2007).

Coping strategies

It has been posited that coping is closely linked to self-regulation (Lazarus & Folkman, 1984; Matheny, Aycock, Pugh, Curlette, & Cannella, 1986). The process of selecting a coping strategy suggests evaluation of personal competence to deal with the problem at hand. Plainly, coping strategies are emotions, cognitions, and behaviors that are used to manage stress (Bryant-Davis, 2005). Usually our typical coping strategies are overwhelmed by traumatic events. However, it is possible for people to employ efficient coping, which results in a match between perceived demands (i.e., stress from a traumatic event) and capacities (i.e., coping strategies; Strelau & Zawadzki, 2006). In this instance, coping could be viewed as a regulatory function that is inseparable from stress.

Amstadter and Vernon (2008) sought to explore the relationship among thought control, emotion regulation, and coping. The researchers noted that their study was the first to include all three regulation categories in the same trauma sample. The results of this study suggested that the use of the three modulation strategies (i.e., thought control, emotion regulation, and coping) was positively related to PTSD, anxiety, and depression

scores. Additionally, the PTSD group generally reported experiencing more symptomatology, including anxiety, anxious arousal, depression, and mixed anxiety than the non-PTSD group (Amstadter & Vernon).

While Amstadter and Vernon (2008) did not examine specific coping strategies, other researchers have investigated the influence and differences between types of coping resources. For example, social support has been included as a type of coping resource (Schumm, Vranceanu, & Hobfoll, 2004). Extant research has acknowledged the importance of social support in response to stressful situations. Pietrzak, Johnson, Goldsten, Malley, and Southwick (2009) suggested that postdeployment social support was negatively associated with severity of traumatic stress and depressive symptoms in a sample of soldiers. It was also discovered that by increasing personal resources, the effects of environmental stressors (i.e., a traumatic event) can be decreased (Wheaton, 1983). As indicated by Ozer, Best, Lipsey, and Weiss (2003) social support as a predictor of PTSD needs further exploration.

The coping resources construct could include a number of different facets. This might include one's ability to successfully cope (Bandura, 1982), an individual's use of a social support network as a protective factor against stressful life events (Schumm et al., 2004), one's use of personal health practices such as exercise (Brown & Siegel, 1988), or an individual's ability to manage their resources (Schlossberg, 1981). These different types of coping resources are all included as scales within the Coping Resources Inventory for Stress (CRIS; Matheny, Curlette, Aycock, Pugh, & Taylor, 1987). Generally, the CRIS was created to measure a comprehensive range of perceived coping resources. Employing a variety of coping resources is likely useful when faced with a

stressful situation, as it has been posited that the measurement of coping resources is more predictive of stressful reactions than the assessment of demands (Hobfoll, 1988; Matheny et al., 1987). However, one specific type of coping resource from the CRIS may be closely related to self-regulation and executive functioning. Tension Control, one of the CRIS scales, assesses an individual's ability to lower arousal through relaxation procedures and thought control (Matheny, Aycock, Curlette, & Junker, 1993). Since self-regulation has been described as one's ability to modulate arousal, the Tension Control scale of the CRIS may be associated with the construct self-regulation.

Executive functioning

Generally, traumatic stress results in an activation of specific brain areas that play a critical role in the body's response (Bremner & Vermetten, 2007). Past research has been conducted specifically with children to examine the ways that early trauma affect brain development. There are a number of different developmental problems that can arise from early trauma, as well as emotional and behavioral problems. Neurochemical systems, the limbic-hypothalamic-pituitary-adrenal axis, corpus callosum, and medial prefrontal regions are just a few areas that are affected (De Bellis, Hooper, & Sapia, 2005). In all, the brainstem, hypothalamus, limbic system, and neocortex are all affected in some manner by trauma (van der Kolk, 2004). As noted by Southwick et al. (2007), a barrier to the neurobiological research of trauma-related psychopathology is due to the enormous complexity of the nervous system. Due to the complexity of neurobiology and the interacting systems that are affected by trauma, the current study focuses specifically on executive functioning.

Specifically, Koenen (2006) noted executive functioning as a particularly relevant regulatory system in relation to PTSD. Executive function is a dynamic concept that includes brain functions such as task-switching, planning, inhibitory control, and working memory (Elliott, 2003). These types of brain functions are critically dependent on the frontal cortex region. Additionally, emotion regulation involves a dynamic interaction between arousal and inhibitory systems which can be found in regions of the prefrontal cortex (Thompson & Goodman, 2010). Emotion regulation typically begins in infancy, and is involved in the healthy development of the prefrontal cortex (Ford, 2009). More specifically, the process of developing the ability to regulate emotions can be disrupted as early as infancy and may influence the development of executive functioning.

Critical to coping with a traumatic event, executive functions involve inhibitory control over impulsive reactions (e.g., underregulation of emotion) and the substitution of more reasoned responding. Therefore, the developmental neurobiology of emotion regulation can be considered as the unfolding of higher cortical inhibitory systems that exert regulatory control over a number of different systems that govern emotional activation (Thompson & Goodman, 2010). A growing functional imaging literature has suggested that PTSD is also associated with alterations in neural activation (Vasterling & Brailey, 2005). Some imaging studies have specifically confirmed a connection between abnormalities in the amygdala and prefrontal cortex in patients with PTSD (Neumeister, Henry, & Krystal, 2007). These results demonstrate the critical role of neurobiology in relation to trauma and suggest that clarification of this relationship is warranted.

In 1991, Wolfe and Charney, suggested that research of stress-related symptoms of PTSD would be enhanced by testing of cognitive functions. Since then, there have

been a handful of studies examining cognitive functioning in relation to symptomatology resulting from PTSD. For example, research has indicated that PTSD participants exhibited greater deficits on frontally mediated tasks than nontraumatized participants (Koenen et al., 2001). Similarly, the Attentional Network Task (ANT; Fan, McCandliss, Sommer, Raz, & Posner, 2002) demonstrated specific deficits in executive functioning among participants meeting criteria for PTSD relative to participants without PTSD histories (Leskin & White, 2007). Interestingly, other tasks measuring executive functioning (trail making tests) did not demonstrate differences among groups. In a sample of college students, it was discovered that there were no significant differences between PTSD and non-PTSD groups (Twamley, Hami, & Stein, 2004).

It is evident that the literature examining executive functioning in relation to experiencing a traumatic event reveals inconsistent results. As noted by many scholars, trauma is complex and dynamic in resulting expression of symptoms and level of dysregulation. It seems that there is a multifaceted system involving frequency and type of traumatic event (Cloitre et al., 2009), emotion dysregulation, executive functioning, and successful employment of coping strategies. Moreover, the combination of these factors seems to affect the level of resulting symptomatology. The current study sought to clarify the relationships between the aforementioned variables in order to provide a better understanding of the processes of trauma.

The purpose of this study was to develop and test a theoretical model that examined how the experience of a traumatic event may contribute to symptomatology. Extant research suggested that the experience of a traumatic event of an interpersonal nature (i.e., physical, sexual, or emotional abuse) may have different results than the

experience of a traumatic event of a non-interpersonal nature (i.e., motor vehicle accident, natural disaster, etc.; Briere & Elliott, 2000; van der Kolk, Roth, Pelcovitz, Sunday, & Spinnazola, 2005). Thus, in the present study, the experience of a traumatic event was differentiated by interpersonal traumatic events and non-interpersonal traumatic events. Due to the complex interactions between variables (i.e., non-interpersonal traumatic events, interpersonal traumatic events, self-regulation, executive functioning, coping resources, depression, and tension-reduction behaviors), structural equation modeling was used in order to simultaneously assess the relationships between all of the variables and also determine which variables had the strongest effect on depression and tension-reduction behaviors.

It was hypothesized that the relationship between interpersonal traumatic events and resulting symptoms would differ from the relationship between non-interpersonal traumatic events and resulting symptoms (see Figure 1). Furthermore, it was thought that self-regulation, executive functioning, and coping resources would mediate the relationship between experiencing a traumatic event (both interpersonal and non-interpersonal) and resulting symptomatology. More specifically, it was predicted that experience of a traumatic event (either interpersonal or non-interpersonal) would directly result in a significant amount of symptomatology compared to individuals who had not experienced a traumatic event. It was also hypothesized that the relationship between experiencing a traumatic event and resulting symptomatology would be mediated by coping resources. Executive functioning was expected to mediate the relationship between experiencing a traumatic event and the amount of symptomatology reported. It was also hypothesized that self-regulation would solely mediate the relationship between

experiencing a traumatic event and the amount of symptomatology reported. Furthermore, it was theorized that both executive functioning and self-regulation would mediate the relationship between experiencing a traumatic event and resulting symptomatology.

Method

Participants

Eligibility criteria for participating in the study included (1) being 18 years or older; and (2) being enrolled in a college undergraduate course(s) at a southeastern regional public university. The current study focused on a college population; however, it should be noted that this sub-group is similar to the general population in terms of their traumatic experiences (Braver et al., 1992; Browne & Winkelman, 2007). Often, college students are considered to be a special group of the population (Arata, Langhinrichsen-Rohling, Bowers, & O'Farrill-Swails, 2005). It is frequently assumed that college students possess greater resiliency, greater privilege, increased social support, and higher levels of education (Arata et al.). Despite these potential differences between college students and the general population, it is important to indicate that the rates of exposure to all types of traumatic experiences in college students are similar to the rates of exposure found in the general population (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993; Freedy, Monnier, & Shaw, 2002). The rates found in college students and the general population range from 36% to 69% (Resnick et al., 1993). Therefore, it seemed appropriate to use a college student population for the current study.

This study relied upon a convenience sample of college men and women from two southeastern universities. Four hundred thirty seven undergraduate students

participated in the study. Participation in the study was voluntary and all completed an informed consent at the beginning of the study (see Appendix B). Due to missing data, the final data set consisted of 391 participants (age: *M* = 22.67, *SD* = 6.34, range 18-62 years). The final sample included 273 females (69.8%), 117 males (29.9%), and one transgendered individual (0.3%). One hundred forty seven individuals (37.6%) reported their year in school as senior, 135 (34.5%) as freshman, 84 (21.8%) as junior, and 24 (6.1%) as sophomore. More than half of the sample reported their race as White/Caucasian/European American (*n* = 204, 52.2%), with other participants reporting their race as Black/African-American (*n* = 123, 31.5%), Asian/Pacific Islander (*n* = 23, 5.9%), Hispanic/Latino/a (*n* = 17, 4.3%), Multiracial/ethnic (*n* = 7, 1.8%), Other (*n* = 7, 1.8%), East Indian (*n* = 5, 1.3%), Middle Eastern (*n* = 3, 0.8%), and Native American/American Indian (*n* = 2, 0.5%). Half of the participants reported being single (*n* = 198, 50.6%), 36.3% (*n* = 142) reported being involved in monogamous dating, 9.0% (*n* = 35) reported being married/partnered, 2.0% (*n* = 8) reported being involved in non-monogamous dating, 1.3% (*n* = 5) reported being divorced, and 0.8% (*n* = 3) reported being married or partnered but separated. The majority of participants self identified as Straight/heterosexual (*n* = 367, 93.9%), followed by Lesbian/gay (*n* = 12, 3.1%), Bisexual (*n* = 11, 2.8%), and Pansexual/omni-sexual (*n* = 1, 0.3%). Approximately 46% (*n* = 180) of participants described their socio-economic status as middle class, 33.5% (*n* = 131) as working class, 18.2% (*n* = 71) as low income, and 2.3% (*n* = 9) as wealthy. Lastly, 96.9% (*n* = 379) denied having any type of disability, while 3.1% (*n* = 12) reported a disability.

Procedure

Undergraduate students enrolled in several introductory psychology and leadership courses were invited to participate in a study titled "Investigating the effects of trauma". Students received an email from their respective course instructor offering an extra credit opportunity. Included in the email was a general description of the study (see Appendix A), as well as a web link to the online study (i.e., SurveyMonkey) so that they could complete the survey if they were interested in participating. They were immediately taken to a page that asked students to give voluntary consent (i.e., informed consent – See Appendix B) prior to participating in the study. Consent was indicated by the student selecting the "next" button at the bottom of the informed consent page. After printing a copy of the informed consent page for their own records, participants were directed to complete the online survey.

Wood, Nosko, Desmarais, Ross, and Irvine (2006) suggested that online surveys are beneficial when asking individuals about sensitive topics such as abuse history since it affords them greater anonymity. Given the sensitive nature of this study, participants were provided the option to discontinue the survey at the end of each section if they began to experience emotional distress. All participants, including those who chose to discontinue the survey, received a generated list of counseling resources (see Appendix C), as well as the contact information of the principal investigator upon completion (or discontinuation) of the survey.

Measures

Demographic sheet. A demographic questionnaire (see Appendix D) was created to gather information on participants' age, gender, sexual orientation, marital status, race/ethnicity, spirituality, year in school, disability status, and socio-economic status.

Trauma Symptom Inventory – Alternate Form. The Trauma Symptom Inventory – Alternate Form (TSI-A; Briere, 1995) assessed posttraumatic symptomatology using 8 clinical scales. The scales included Anxious Arousal (AA), Anger/Irritability (AI), Depression (D), Defensive Avoidance (DA), Dissociation (DIS), Intrusive Experiences (IE), Impaired Self-Reference (ISR), and Tension-Reduction Behaviors (TRB). There were 3 validity scales, including Response Level (RL), Atypical Response (ATR), and Inconsistent Response (INC). Participants were asked to rate 86 items using a 4-point Likert-scale ranging from 0 (never) to 3 (often) over the previous 6 months. Overall scores for each clinical scale were calculated for each participant, representing the sum of ratings across the questions, with higher scores representing a higher level of symptoms experienced. Sample items included, "In the last 6 months, how often have you experienced feeling high anxiety," and "In the last 6 months, how often have you experienced trying to block out certain memories?"

The TSI is the most frequently used self-report instrument for posttraumatic symptom assessment with adults (Elhai, Gray, Kashdan, & Franklin, 2005). The TSI scales have very good internal consistency reliabilities with mean alphas ranging from .84 to .87 (Briere, 1995). Reliabilities for the individual TSI scales ranged from .64 to .89 in a university population (Runtz & Roche, 1999), .74 to .91 in the standardization sample, .69 to .90 in a university sample, and .76 to .88 in a Navy recruit sample (Briere, 1995).

Good construct validity has been demonstrated by the TSI, as it has been shown to differentiate between PTSD and non-PTSD groups using the PTSD-focused scales of the TSI (AA, DA, D, IE, and DIS) with significant effect sizes of .26 to .53 (McDevitt-

Murphy, Weathers, & Adkins, 2005). All four trauma scales of the TSI were significantly associated with 4 types of trauma (i.e., childhood and adult interpersonal violence and disaster; Briere, 1995). Good convergent and discriminant validity (.36 to .73) has been demonstrated with other self-report measures of PTSD (McDevitt-Murphy et al., 2005). Criterion validity was also assessed using the standardization sample. Briere (1995) reported that all of the TSI scales accurately predicted more than 90% of those with PTSD in the sample. Based on the results from McDevitt-Murphy et al. (2005), the current study specifically focused on the Anxious Arousal and Depression scales of the TSI-A. Furthermore, the Tension-Reduction Behavior (TRB) scale of the TSI-A assessed a respondent's tendency to turn to external methods of reducing internal tension or distress. These methods included self-mutilation, angry outbursts, or suicide threats. Given the description of the TRB scale, it was quite likely that these behaviors would be controlled by self-regulation or executive functioning. Therefore, the TRB scale was included in the hypothesized model as well.

Early Trauma Inventory Self Report – Short Form. The Early Trauma Inventory Self Report – Short Form (ETISR-SF; Bremner, Vermetten, & Masure, 2000) was designed to measure early childhood trauma. Bremner et al. (2000) reported that the ETISR-SF was a valid and reliable instrument for the measurement of early traumatic experiences, which was evidenced by the ETISR-SF's significant relationships with other similar instruments and related constructs (e.g., childhood abuse, PTSD, and dissociation). Furthermore, the ETISR-SF demonstrated excellent two- to four-week test-retest reliability (r = .91) and internal consistency (Cronbach's coefficient alpha = .95; Bremner et al., 2000). Using the ETISR-SF, non-interpersonal trauma and interpersonal

(i.e., physical, sexual, and emotional abuse) traumas were considered as continuous variables. Based on extant research suggesting that severity and frequency are important aspects of trauma assessment (Keane, Weathers, & Foa, 2000, as cited in Keane, Brief, Pratt, & Miller, 2007; Ruscio, Ruscio, & Keane, 2002), treating the trauma scores as continuous variables (i.e., sum scores) was an accurate measure of trauma and psychometrically valuable.

Participants were asked to complete a slightly modified version of this 27-item measure. The original version was used to assess childhood trauma. The current version was not limited to assess childhood trauma. Specifically, the current version assessed both childhood and adult trauma. Each item was dichotomously scored. Overall non-interpersonal and interpersonal trauma scores were calculated for each participant, representing the sum of "Yes" responses across the 27 questions, with higher scores representing more traumatic experiences. Items included, "Did you ever see someone murdered?" and "Were you often told you were no good?" Following each item, participants were asked, "Did you experience emotions of intense fear, horror, or helplessness?" The response choices to the aforementioned question were then "yes" or "no". The original version of the ETISR-SF asked "Did you experience emotions of intense fear, horror, or helplessness" only once at the end of the inventory. Bremner et al. (2000) granted permission for the instrument to be modified so that emotions of intense fear, horror, or helplessness were assessed for each item, rather than on one occasion for the entire inventory. Adding this question was not expected to affect the original psychometrics of the instrument since the actual item content was not modified. It was beneficial to add the question (i.e., did you experience emotions of intense fear, horror, or

helplessness) to each item of the inventory, as this emotional response is required for the event to be described as traumatic (American Psychiatric Association, 2000).

The Coping Resources Inventory for Stress – Short Form. The Coping Resources Inventory for Stress-Short Form (CRIS-SF; Curlette & Matheny, 2008) was a 70-item scale that measured perceived coping resources. The CRIS-SF was constructed from the Coping Resources Inventory for Stress (CRIS; Matheny, Curlette, Aycock, Pugh, & Taylor, 1987) which had excellent reliability and validity. Participants responded to the items on a 4-point Likert scale from 1 (strongly agree) to 4 (strongly disagree). Overall scores for each clinical scale and subscale were calculated for each participant (items are reverse scored), representing the mean of ratings across the questions with higher scores representing a greater level of coping resources. Coefficient alpha reliabilities for the 6 primary scales ranged from .84 to .88 (Matheny & Curlette, 2010), while the reliabilities for the 12 subscales ranged from .78 to .88. The overall score of the CRIS-SF had the highest reliability coefficient (.93).

The CRIS-SF had one overall scale, six primary scales and twelve subscales all derived from factor analysis. The primary scales and the subscales along with the number of items, Cronbach alphas, and correlations between the CRIS-S primary scales with the CRIS scales are as follows. Confidence (10 items, alpha = .90, correlation = .95) measured an individual's ability to reach their goals by controlling their emotions and mastery over their environment and included two subscales: Situational Control (5 items, alpha = .86) and Emotional Control (5 items, alpha = .83). Social Support (12 items, alpha = .88, correlation = .94) assessed the quality of one's social network and included two subscales: Support from Family (5 items, alpha = .89) and Support from Friends (7

items, alpha = .87). Tension Control (15 items, alpha = .85, correlation = .95) measured the ability to successfully use relaxation techniques and thought control and included the subscales: Physical Tension Control (5 items, alpha = .75) and Mental Tension Control (10 items, alpha = .84). Structuring (10 items, alpha = .91, correlation = .94) measured an individual's ability to organize their time and resources and included the subscales Making Plans (5 items, alpha =.85) and Carrying Out Plans (5-items, alpha =.89). Physical health (11 items, alpha = .85, correlation = .78) was an overall measure of an individual's physical wellness and lack of both illness and disability and included the following subscales: Wellness (6 items, alpha = .82) and Energy (5 items, alpha =.83). Self-Directedness (11 items, alpha = .87, correlation = .96) measured an individual's assertiveness and decision-making skills in interpersonal relationships and included the following subscales: Asserting One's Rights (6 items, alpha = .81) and Trusting Oneself (5 items, alpha = .85).

Dysexecutive Questionnaire. The Dysexecutive Questionnaire (DEX; Wilson, Alderman, Burgess, Emslie, & Evans, 1996) was designed to assess executive functioning. In other words, this measure examined everyday signs of dysexecutive symptoms. Participants were asked to complete 20 items and rated them according to their personal experience. Each item was scored using a 5-point Likert-scale ranging from never (0) to very often (4). An overall score was calculated for each participant, representing the sum of ratings across the 20 questions with higher scores representing greater cognitive-regulation impairment. Sample items included, "I act without thinking doing the first thing that comes to mind" and "I find it hard to stop repeating saying or doing things once started."

The 20 items loaded onto 5 different factors, including inhibition, intentionality, executive memory, positive affect, and negative affect. Previous studies reported high internal consistency when using the measure in both clinical and control cohorts (Bruce, Ray, Bruce, Arnett, & Carlson, 2007). High alpha reliability was also demonstrated (Cronbach's coefficient alpha = .86; Magar, Phillips, & Hosie, 2008).

Self-Regulation Questionnaire. The Self-Regulation Questionnaire (SRQ; Brown, Miller, & Lawendowski, 1999) was developed to assess self-regulatory processes. Participants were asked to complete 63 items and rate them using a 5-poing Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree). An overall score was calculated for each participant, representing the sum of ratings across the 63 items with higher scores indicating high (intact) self-regulation capacity. Sample items included, "I get easily distracted from my plans," and "I put off making decisions."

Aubrey, Brown, and Miller (1994) demonstrated excellent reliability of the SRQ. In a community sample, the SRQ was administered twice in a 48-hour period to test stability of scores. Test-retest reliability for the total SRQ score was high (r = .94). Additionally, internal consistency was .91.

Data Analyses

Data was initially input into SPSS to manage the data set. A raw data file was maintained in SPSS. Prior to testing the model, the data was analyzed for missing data, outliers, multicollinearity, non-normality (i.e., skew and kurtosis), and ill scaled covariance matrix. In regard to the issue of missing data, listwise deletion method was employed (Jöreskog & Sörbom, 2003; Kline, 2005). Outliers or extreme scores (i.e., scores that are more than 3 standard deviations beyond the mean) were removed from the

data set. Multicollinearity occurs when two variables are highly correlated (i.e., >.85; Tabachnick & Fidell, 2007). The correlation coefficients revealed that multicollinearity was not a concern within this data set. Non-normality was assessed by examining distributional plots of variables of interest, and these distributional plots indicated normality for all variables of interest.

Lisrel 8.80 (Jöreskog & Sörbom, 2006) was used to test a series of models that simultaneously examined relations between trauma experiences (independent variable), self-regulation, executive functioning, and coping resources (the mediator variables), and three TSI-A subscales of anxious arousal, depression and tension reduction behaviors (dependent variables). The structural models were tested using manifest, or observed variables.

There are several types of methods that can be used to test and interpret meditational hypotheses using structural equation modeling. Norris (1998) suggests that partial mediation occurs when the direct effect is less than the total effect. In other words, the indirect effects via the mediator variable account for part of the observed relation. Total mediation occurs when the indirect effect equals the total effect. More specifically, there are no direct effects between the independent variable and the dependent variable when full mediation occurs. Similarly, Kline (1998) indicated that insignificant direct effects and significant indirect effects represent the strongest demonstration for a mediator effect.

For the first model (i.e., Model 1), the experience of a traumatic event was treated as a categorical variable (i.e., no trauma, non-interpersonal trauma, interpersonal trauma). It was predicted that experience of a traumatic event (either interpersonal or non-

interpersonal) will directly result in a significant amount of symptomatology compared to individuals who have not experienced a traumatic event. It was also hypothesized that the relationship between experiencing a traumatic event and resulting symptomatology would be mediated by coping resources. Executive functioning would mediate the relationship between experiencing a traumatic event and the amount of symptomatology reported. It was also possible that self-regulation would solely mediate the relationship between experiencing a traumatic event and the amount of symptomatology reported. Furthermore, it was theorized that both executive functioning and self-regulation would mediate the relationship between experiencing a traumatic event and resulting symptomatology (see Figure 1). Prior research suggested that the frequency of trauma affects the resulting symptomatology and dysregulation (e.g., Ford, Stockton, Kaltman, & Green, 2006). Therefore, the second model (i.e., Model 2) treated the experience of a traumatic event as a continuous variable. In other words, no trauma, non-interpersonal trauma, and interpersonal trauma were distinct variables. All aforementioned hypotheses remained the same for Model 2.

Initially, the proposed model (see Figure 1) produced a poor fit. Subsequent analyses indicated a fairly saturated model using the Tension Control scale of the CRIS-SF (see Figure 4). An alternative fifth model was analyzed using the Mental Tension Control subscale of the CRIS-SF (see Figure 5). The final model (i.e., Model 4; see Figure 4) reflected the most parsimonious model incorporating the hypothesized relationships.

Fit Indices

Multiple measures were used to determine fit of the structural models. Different fit indices take into consideration various factors such as proportion of observed covariances explained by the covariances implied by the model, proportion of improvement of the overall fit of model relative to a null model, sample size, number of parameters, and residuals. Thus, using several fit indices provides a more comprehensive indicator of model fit. As recommended by Kline (1998), the Tucker-Lewis Non-normed Fit Index (NNFI) and Bentler's Comparative Fit Index (CFI) were used to determine goodness of fit of the models. Both of these measures take into account the number of parameters in the model and should equal or exceed .90 to be considered acceptable. Additional fit indices were considered including the Adjusted Goodness of Fit Index (AGFI; > .90; which is a LISREL estimate similar to the NNFI and CFI although it is not an incremental fit index and only considers the researcher's model), the Chi-square to degrees of freedom ratio (x2/df should be < 3; reduces the sensitivity of the chi square statistic), the Root Mean Square Error of Approximation (RMSEA; should be ≤ .08; is a population error of approximation), the Standardized Root Mean Square Residual (SRMR; should be < .10; this considers covariance residuals which are the differences between the observed and model implied covariances), and the model Akaike information criterion (AIC; the observed value is not important, rather, the value is taken into consideration when testing multiple models, as the lowest AIC value reflects the best fitting model).

Results

Preliminary Analyses

Due to missing data for some participants, the effective sample size for the analyses was 391 participants (89.4% of original sample). All variables were assessed for normality, and results indicated that all variables reflected the normal curve. Descriptive statistics and coefficient alphas for the measures are displayed in Table 1. Internal consistency (Cronbach's coefficient alphas) was adequate for all measures, including SRQ (alpha =.90), DEX (alpha =.94), CRIS-SF (alpha =.94), Tension Control scale (alpha =.82), Mental Tension Control subscale (alpha =.74), Depression (alpha =.91), and Tension-Reduction Behaviors (alpha =.98; see Table 1 for additional information).

Table 1

Descriptive Statistics for Scale Scores

Measure	Min.	Max.	*M*	*SD*	*A*
ETISR_NONIPT	0	8.00	2.47	1.92	
ETISR_IPT	0	16.00	3.56	3.09	
SRQ	126.00	277.00	212.2	24.37	.90
DEX	0	78.00	15.23	8.47	.94
CRIS-SF	1.22	3.88	2.79	0.35	.94
Confidence	1.00	4.00	2.77	0.45	.80
Social Support	1.00	4.00	2.95	0.53	.86
Tension Control	1.20	4.00	2.67	0.41	.82
Structuring	1.30	4.00	2.78	0.47	.80
Physical Health	1.27	4.00	2.86	0.51	.83
Self-Directedness	1.09	4.00	2.73	0.49	.82
Situational Control	1.00	4.00	2.94	0.56	.86
Emotional Control	1.00	4.00	2.59	0.55	.72
Support from Family	1.00	4.00	2.91	0.77	.90
Support from Friends	1.00	4.00	2.97	0.56	.83
Physical Tension Control	1.00	4.00	2.60	0.63	.83
Mental Tension Control	1.00	4.00	2.70	0.41	.74
Making Plans	1.00	4.00	2.74	0.61	.84
Carrying Out Plans	1.40	4.00	2.86	0.57	.80
Wellness	1.17	4.00	3.02	0.64	.84
Energy	1.00	4.00	2.66	0.54	.66

Asserting One's Rights	1.00	4.00	2.81	0.51	.74
Trusting Oneself	1.00	4.00	2.64	0.72	.88
TSI-A					
Anxious Arousal	8	32	14.28	4.86	.84
Depression	8	32	13.79	5.42	.91
Anger/Irritability	9	36	16.92	6.26	.91
Intrusive Experiences	8	32	13.38	5.32	.90
Defensive Avoidance	8	32	14.79	6.22	.91
Dissociation	9	36	14.60	5.34	.88
Impaired Self-Reference	9	36	15.36	5.78	.89
Tension-Reduction Beh	8	32	11.26	3.90	.98

Note. N = 391; Min = minimum; Max = maximum; ETISR_NONIPT = Early Trauma Inventory- Self Report, Non-interpersonal trauma; ETISR_IPT = Early Trauma Inventory-Self Report, Interpersonal Trauma; SRQ = Self-Regulation Questionnaire; DEX = Dysexecutive Questionnaire; CRIS-SF = Coping Resources Inventory of Stress – Short Form; TSI-A = Trauma Symptom Inventory – Alternate Form.

On average, participants reported experiencing 2.5 non-interpersonal traumatic events and 3.5 interpersonal traumatic events. Overall, participants reported low (impaired) self-regulation capacity as indicated by a mean of 212.2 (*SD* = 24.37; Brown, Miller, & Lawendowski, 1999). In terms of dysexecutive functioning, the mean was 15.23 (*SD* = 8.47). The mean for coping resources as measured by the CRIS-SF was 2.79 (*SD* = 0.35), the mean as measured by Tension Control was 2.67 (*SD* = 0.41), and the mean as measured by Mental Tension Control was 2.70 (*SD* = 0.41). The mean score for the depression scale was 13.79 (*SD* = 5.42), while the mean score for tension-reduction behaviors was 11.26 (*SD* = 3.90). Means and standard deviations for all measures, as well as their scales and subscales are presented in Table 2.

Correlation coefficients between all the variables were determined (see Table 2). Non-interpersonal trauma and interpersonal trauma were significantly correlated ($p < .01$). This correlation suggested that there was a high likelihood of participants experiencing

interpersonal trauma also experiencing non-interpersonal trauma. As expected, CRIS-SF, CRIS-Tension Control, and CRIS-Mental Tension Control were all correlated ($p < .01$) since Tension Control and Mental Tension are both derived from the full CRIS-SF. The Depression and Tension-Reduction Behaviors scales were significantly correlated ($p < .01$), which was consistent with the development and reliability of the TSI (Briere, 1995). Furthermore, Executive Functioning and Self-Regulation were highly correlated ($p < .01$). This indicated that these two constructs were highly related to each other, which was consistent with previous literature noting the overlap of these two systems. Non-interpersonal trauma, interpersonal trauma, tension control, self-regulation, and executive functioning were all significantly correlated with the two outcome variables, depression and tension-reduction behaviors ($p < .01$).

The variables that are used in the final post hoc model (i.e., Model 4) are presented in Table 2. Based on responses to the ETISR-SF, most participants (95%) had experienced one or more traumatic life events. Five percent of the sample denied experiencing a traumatic event, while 12% reported experiencing a non-interpersonal traumatic event, 8% indicated experiencing an interpersonal traumatic event, and 75% reported experiencing both a non-interpersonal and an interpersonal traumatic event. The most commonly reported trauma was being pushed or shoved (55%). Table 3 illustrates the percentage of participants who reported the various types of trauma.

As previously mentioned, preliminary analyses indicated significant bivariate correlations among most variables of interest. These variables met the necessary criteria to proceed with analyses that establish mediation. Furthermore, maximum likelihood (ML) estimation was used on the models. The principle underlying the widely used

Table 2

Correlations among Variables, Means, and Standard Deviations

Scale	1	2	3	4	5	6	7	8
1. NON-IPT	-							
2. IPT	.480**	-						
3. CRIS-TC	-.018	-.128**	-					
4. CRIS-MT	-.053	-.162**	.888**	-				
5. SRQ	-.027	-.126*	.294**	.415**	-			
6. DEX	.245**	.378**	-.298**	-.321**	-.417**	-		
7. DEP	.244**	.370**	-.344**	-.385**	-.306**	.614**	-	
8. TRB	.230**	.321**	-.193**	-.239**	-.290**	.636**	.606**	-
Mean	2.47	3.56	2.67	2.70	212.20	15.23	13.79	11.26
SD	1.92	3.09	.411	.414	24.37	14.46	5.43	3.90

Note. Abbreviations: NON-IPT = Non-interpersonal traumatic experiences; IPT = Interpersonal traumatic experiences; CRIS-TC = Coping Resources Inventory Scale, Tension Control; CRIS-MT = Coping Resources Inventory Scale, Mental Tension Subscale; SRQ = Self-Regulation Questionnaire; DEX = Dysexecutive Questionnaire; DEP = Trauma Symptom Inventory-Alternate Form, Depression Subscale; TRB = Trauma Symptom Inventory – Alternate Form, Tension Reduction Behaviors Subscale.
*$p = < .05$. **$p = < .01$.

Table 3

Percentage of Participants Reporting Each Type of Trauma (*n* = 391)

Trauma	Percentage of Participants Endorsing Event
Natural disaster[1]	19.4
Serious accident[1]	19.7
Personal illness or injury[1]	26.9
Death/serious illness of parent/caregiver[1]	17.1
Divorce/separation of parents[1]	34.0
Death/serious injury of sibling[1]	7.9
Death/serious injury of friend[1]	38.1
Witness violence[1]	36.6
Mental illness of family member[1]	29.4
Parents/caretaker alcoholism/drug abuse[1]	15.3
Witness murder[1]	2.6
Slapped in face with open hand[2]	43.7
Burned with hot water, cigarette, other object[2]	19.4
Punched/kicked[2]	34.8
Hit with thrown object[2]	38.9
Pushed/shoved[2]	55.2
Put down/ridiculed[2]	37.9
Ignored/made to feel insignificant[2]	29.4
Often told he/she was no good[2]	14.1
Frequently treated in cold, uncaring way[2]	8.2

Parents/caretakers fail to understand needs[2]	17.4
Touched in intimate part of body/felt uncomfortable[2]	16.9
Someone rubbing genitals against him/her[2]	18.7
Forced to touch another person's intimate parts[2]	7.9
Forced to have genital sex[2]	6.1
Forced to perform oral sex[2]	3.6
Forced to kiss someone in sexual way[2]	3.3

Note. [1] denotes non-interpersonal trauma; [2] denotes interpersonal trauma.

method of ML is that if the estimates are assumed to be population values, they are ones that maximize the probability that the observed covariances were drawn from the general population (Kline, 1998). Path analysis was performed on a Pearson correlation matrix for the models described below. As previously noted, path coefficients were estimated using maximum likelihood and are presented in standardized format as suggested by Schumacker and Lomax (2010).

The Path Models

Models 1 and 2. Initially, a recursive model (i.e., all causal effects are unidirectional and disturbances are uncorrelated) reflecting the hypothesized paths was tested to examine relative contributions of the mediating variables on the trauma symptom variables. The hypothesized model was presented in Figure 1, where rectangles represent measured variables. Specifically, Models 1 (see Figure 1) and 2 (see Figure 2) focused on the full CRIS-SF measure, as well as the TSI-A scales, Anxious Arousal, Depression, and Tension-Reduction Behaviors. Model 1 was treated as a mixture model

(Schumacker & Lomax, 2010), as it involved the analysis of observed variables that were both categorical and continuous. PRELIS (Pre-Lisrel) was used to input, edit, and handle raw data and produced the polyserial matrix of data that was needed for the LISREL 8.80 program. Once the appropriate variance-covariance matrix was created, the MVPA analysis was conducted as usual. MVPA analyses from both Models 1 and 2 produced identical results, thus verifying that the use of the mixture model or continuous model was equally appropriate. The fit for both Models 1 and 2 was extremely poor. Indications of poor fit included, χ^2 (9) = 340.19, $p < .001$, comparative fit index (CFI) = .31, nonnormed fit index (NNFI) = .37 (see Table 4 for additional measures of fit).

Due to the poor fit of the model, it seemed appropriate to re-assess the theoretical approach and consider the appropriateness of the TSI-A scales that were used in the hypothesized model. Post-hoc model modifications were performed in an attempt to develop a better fitting and possibly more parsimonious model. The TSI-A scales, Anxious Arousal, Depression, and Tension-Reduction Behaviors were included in Models 1 and 2 as a result of previous literature (e.g., Brennan & Shaver, 1995; Heim & Nemeroff, 2001; McDevitt-Murphy et al., 2005) stating that these scales were most related to symptoms of PTSD. Given that the current study did not assess PTSD, rather the current study examined traumatic experiences, it seemed that perhaps Anxious Arousal was not the most appropriate TSI-A scale to include in the model. To test this theoretical implication, the variable Anxious Arousal was removed from the model, which resulted in dependent variables including Depression and Tension-Reduction Behaviors.

Model 3. Once the MVPA was conducted for both Model 1 and Model 2, modification indices suggested by LISREL 8.80 were consulted. LISREL 8.80 provided suggestions for improving data-model fit by adding or deleting paths in the model. It was determined that paths would only be added if they were theoretically supported. Wald indices were used to determine if the deletion of specific paths would improve data-model fit. Subsequent to completing modifications, the path coefficients of the model were interpreted in order to assess which are statistically significant. Specifically, after consulting modification indices, a path was added from Self-Regulation to Coping Resources, Self-Regulation to Executive Functioning, and Executive Functioning to Coping Resources. The addition of the aforementioned paths was supported by previous literature (e.g., Folkman, 1984; Koenen, 2006). The error variances of Depression and Tension-Reduction Behaviors were set to correlate, as these two variables were highly correlated since they are both subscales from the TSI-A. Additionally, the error variances of Depression and Executive Functioning were set to correlate due to the high correlation and previous research suggesting that there is a strong relationship between these two variables (Heim, Mletzko, Purselle, Musselman, & Nemeroff, 2007).

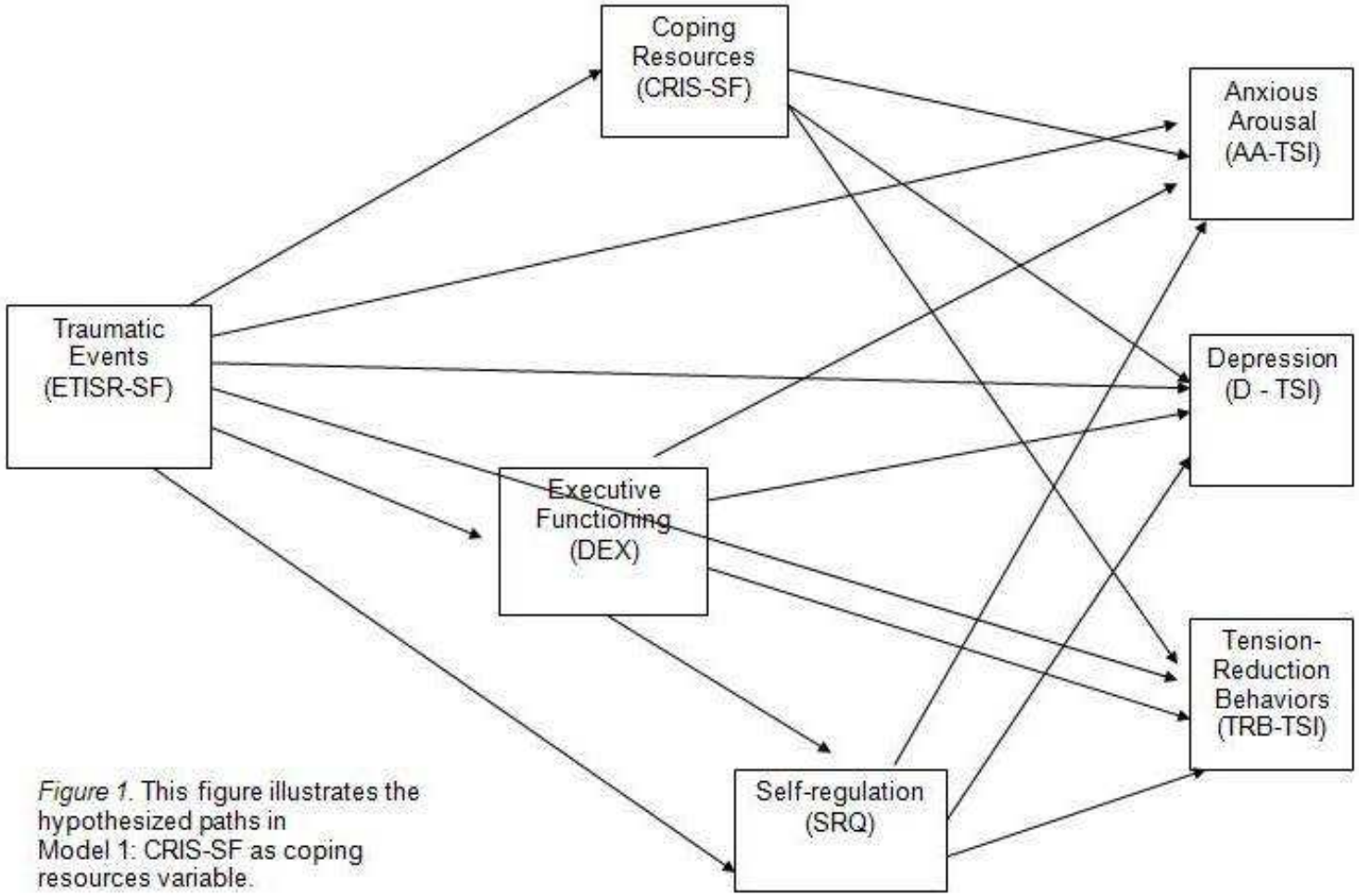

Figure 1. This figure illustrates the hypothesized paths in Model 1: CRIS-SF as coping resources variable.

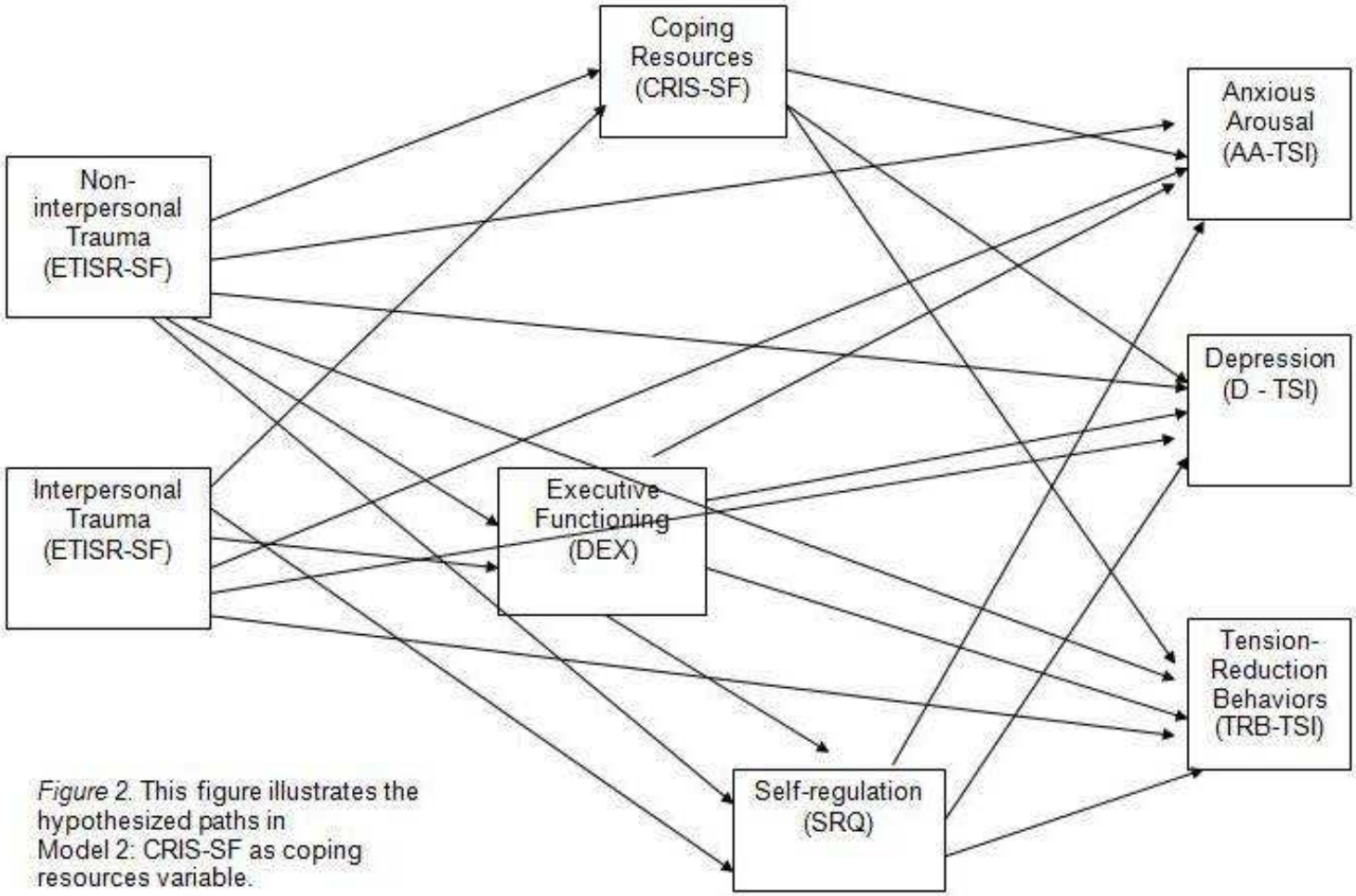

Figure 2. This figure illustrates the hypothesized paths in Model 2: CRIS-SF as coping resources variable.

Table 4

Model Fit Summary

Model	χ^2	df	χ^2/df	CFI	AGFI	NNFI	RMSEA	SRMR	Model AIC
1. Original Model (CRIS-SF)	340.19*	9	37.7	.74	.38	.38	.31	.16	378.2
2. Mixture Model (CRIS-SF)	340.19*	9	37.7	.74	.38	.38	.31	.16	378.2
3. Model 3 (CRIS-SF)	6.44	2	3.22	.99	.93	.94	.07	.02	58.44
4. Final Model (Tension Control)	6.46	3	2.15	.99	.96	.98	.05	.02	56.46
5. Alt. Model (Mental Tension)	6.51	3	2.17	.99	.95	.97	.05	.02	56.51

Note. CFI = Bentler's Comparative Fit Index; AGFI = Adjusted Goodness of Fit Index; NNFI = Non-Normed Fit Index; RMSEA = Root Mean Error of Approximation; SRMR = Standardized Root Mean Square Residual; Model AIC = Akaike information criterion.
* Model significant $p < .05$.

The fit for Model 3 improved from Models 1 and 2. Indications of better fit included, χ^2 (2) = 3.22, p = .092, comparative fit index (CFI) = .99, and nonnormed fit index (NNFI) = .94 (see Table 4 for additional measures of fit). While this model was nonsignificant (an indicator of good fit), the AGFI and RMSEA did not suggest that this model produced a good fit. Specifically, the AGFI is measured from 0 (no fit) to 1 (perfect fit; Schumacker & Lomax, 2010). An AGFI value of .93 was acceptable but not suggestive of the best fit. Also, a RMSEA value between .05 and .08 suggested a reasonable error of approximation, while a value less than or equal to .05 suggested a close approximate fit (Kline, 2005). The RMSEA value in this model suggested a reasonable error of approximation.

The stability index was 7.303 (i.e., β eigenvalue), which indicated that the model was not stable due to high indirect effects. High indirect effects typically result from paths greater than one as well as reciprocal connections. According to Jöreskog (1999), paths (i.e., standardized total effects) greater than one do not indicate that there is something wrong with the data. Jöreskog suggests that a standardized coefficient greater than one may suggest that there is a high degree of multicollinearity in the data. The scales of the TSI-A (i.e., Depression and Tension-Reduction Behaviors) are highly correlated and may be the cause of the total effects being greater than one.

Furthermore, in Model 3, the variable that was assessing Coping Resources, as measured by the full CRIS-SF, did not mediate the paths between trauma experiences and symptoms in Model 3 (see Figure 3). In other words, there was no direct effect from non-interpersonal traumatic events or interpersonal traumatic events to coping resources. Also, there was no direct effect from coping resources to either outcome variable,

depression or tension-reduction behaviors. As a result of mediocre goodness-of-fit indices and in an attempt to assess coping resources in a more specific and accurate manner, the Tension Control scale was added to Model 4 in place of the full CRIS-SF since the Tension Control scale has been noted as being related to self-regulation (Matheny et al., 1993). Furthermore, in an attempt to ensure that the best model and variable assessing coping resources were analyzed, the subscale of Tension Control, Mental Tension, was added to an alternative model (i.e., Model 5).

Model 4. In this final post-hoc model, sixteen parameters were estimated. Figure 4 illustrates significant paths in the model. Standardized estimates ranged from .00 (Tension Control to Tension-Reduction Behaviors) to .91 (Executive Functioning to Depression). Of note, in the previous model, Coping Resources (as measured by the CRIS-SF) did not have a direct effect on either of the symptom variables. In the current model, Model 4, Tension Control had a direct effect on depression. Nonsignificant paths included the following: Noninterpersonal trauma events to Tension Control; Noninterpersonal trauma events to Self-Regulation; Interpersonal trauma events to Tension Control; Self-Regulation to Depression; Self-Regulation to Tension-Reduction Behaviors; and Tension Control to Tension-Reduction Behaviors. The model fit well, χ^2 (3) = 6.46, $p < .09$, comparative fit index (CFI) = .99, nonnormed fit index (NNFI) = .98 (see Table 4 for additional measures of fit).

Structural equations were calculated for each independent variable. Specifically, self-regulation, executive functioning, and trauma (both non-interpersonal and interpersonal) accounted for 12% of the variance in tension control. Trauma (both non-interpersonal and interpersonal) accounted for 2% of the variance in self-regulation.

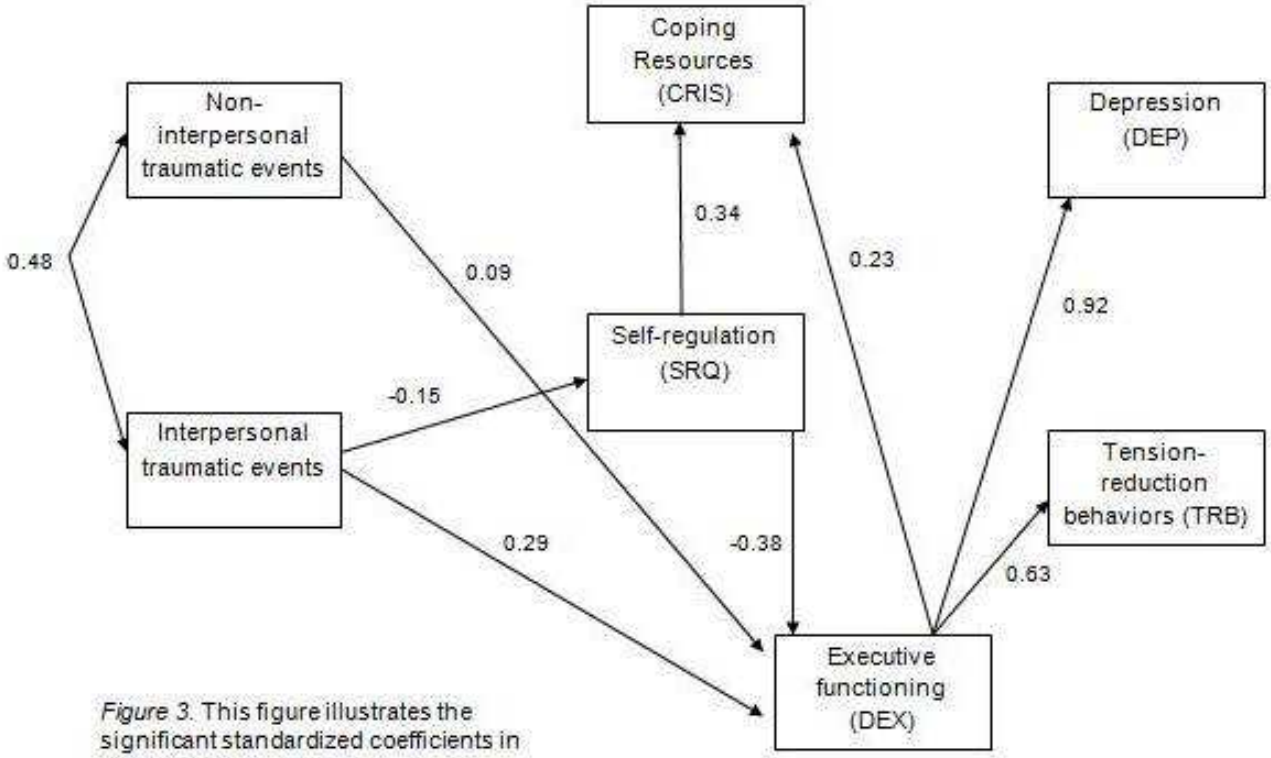

Figure 3. This figure illustrates the significant standardized coefficients in Model 3: CRIS-SF as coping resources variable.

Self-regulation and trauma (both non-interpersonal and interpersonal) accounted for 29% of the variance in executive functioning. For depression, 81% of the variance was accounted for by the variables tension control, self-regulation, and executive functioning. Tension control, self-regulation, and executive functioning accounted for 41% of the variance in tension-reduction behaviors.

Table 5 depicts direct effects of the independent and mediating variables on the dependent variables for this final post-hoc model (Schumacker & Lomax, 2010). Standardized path coefficients can be interpreted directly, as an absolute value less than .10 suggests a small effect; values around .30 suggest a medium effect; and a large effect might be suggested by coefficients with absolute values of .50 or greater (Kline, 2005). Both of the independent variables (non-interpersonal trauma and interpersonal trauma) had small effects on depression and tension-reduction behaviors. Of the mediating variables, tension control had a small direct effect on depression, while executive functioning had large effects on both depression and tension-reduction behaviors. Self-regulation had a small effect on depression and no effect on tension-reduction behaviors.

Table 5
Comparison of Direct Effects of the Independent Variables & Mediating Variables on Trauma Symptom Variables for Final Post-Hoc Model

Dependent Variable	Independent Variables		Mediating Variables		
	Non-ipt	Ipt	Tens	SRQ	DEX
Depression	0.05	0.06	-0.11*	0.10	0.91*
TRB	0.05	0.07	0.00	-0.03	0.62*

Note: Standardized estimates. TRB = Tension-Reduction Behaviors; Non-ipt = Non-interpersonal trauma; Ipt = Interpersonal Trauma; Tens = Tension Control; SRQ = Self-regulation; DEX = Executive functioning. * $p < .05$.

Table 6 shows indirect effects of non-interpersonal trauma on the dependent variables. Through the mediator variable executive functioning, non-interpersonal trauma indirectly has a small effect on both depression and tension-reduction behaviors. There was no effect from non-interpersonal trauma through executive functioning and tension control on depression.

Table 6

Comparison of Indirect Effects of Non-interpersonal Trauma on Trauma Symptom Variables for Final Post-Hoc Model

	Depression	Tension-Reduction Behaviors
DEX	0.091	0.062
DEX → TC	0.002	0.000

Note: Standardized estimates. DEX = Executive functioning; TC = Tension Control.

Table 7 denotes the indirect effects of interpersonal trauma on depression and tension-reduction behaviors. Through executive functioning, interpersonal trauma indirectly has a medium sized effect on depression and a small effect on tension-reduction behaviors. Furthermore, the indirect effect from interpersonal trauma through self-regulation and executive functioning on depression was small, while the indirect effect on tension-reduction behaviors was nonsignificant. The indirect effect from interpersonal trauma through executive functioning and tension control on depression was nonsignificant.

Table 7

Comparison of Indirect Effects of Interpersonal Trauma on Trauma Symptom Variables for Final Post-Hoc Model

	Depression	Tension-Reduction Behaviors
DEX	0.255	0.174
DEX → TC	0.006	0.000
SRQ → DEX	0.052	0.035
SRQ → TC	0.003	0.000

Note: Standardized estimates. DEX = Executive functioning; SRQ = Self-regulation; TC = Tension Control.

Several methods were utilized to test mediation. In the first method, direct paths were added from trauma (both interpersonal and non-interpersonal) to symptoms (depression and tension-reduction behaviors). Total mediation would occur if the indirect effect equaled the total effect. More specifically, there would be no direct effects between the independent variable and the dependent variable if full mediation occurred (Schumacker & Lomax, 2010). Similarly, Kline (1998) indicated that insignificant direct effects (i.e., from trauma to symptoms) and significant indirect effects (i.e., from trauma to mediator variable to symptoms) represented the strongest demonstration for a mediator effect. Therefore, if a fully mediational model existed, the direct effects from trauma (both non-interpersonal and interpersonal) to symptoms (depression and tension-reduction behaviors) would be insignificant. The results indicated that the direct effects from trauma to symptoms were not significant, while the indirect effects from trauma to symptoms were significant, thus, supporting full mediation in this model.

The second method to test mediation also involved adding direct paths from trauma (both interpersonal and non-interpersonal) to symptoms (depression and tension-reduction behaviors). To support this model, the chi-square difference test must not be significant and other measures of fit must remain acceptable (Kline, 2005). The results indicated that adding the direct paths from trauma (both interpersonal and non-interpersonal) to depression and tension-reduction behaviors worsened the fit of the model. In other words, adding the direct paths changed the model fit in a poor manner. Furthermore, the chi-square difference test was significant, thus suggesting that the relationship between trauma and symptoms was fully mediated (Kline, 2005). More specifically, these results suggested that trauma did not directly influence depression and

tension-reduction behaviors. Rather, this suggested that trauma (both non-interpersonal and interpersonal) influenced self-regulation, executive functioning, and tension control, which in turn, influenced depression and tension-reduction behaviors.

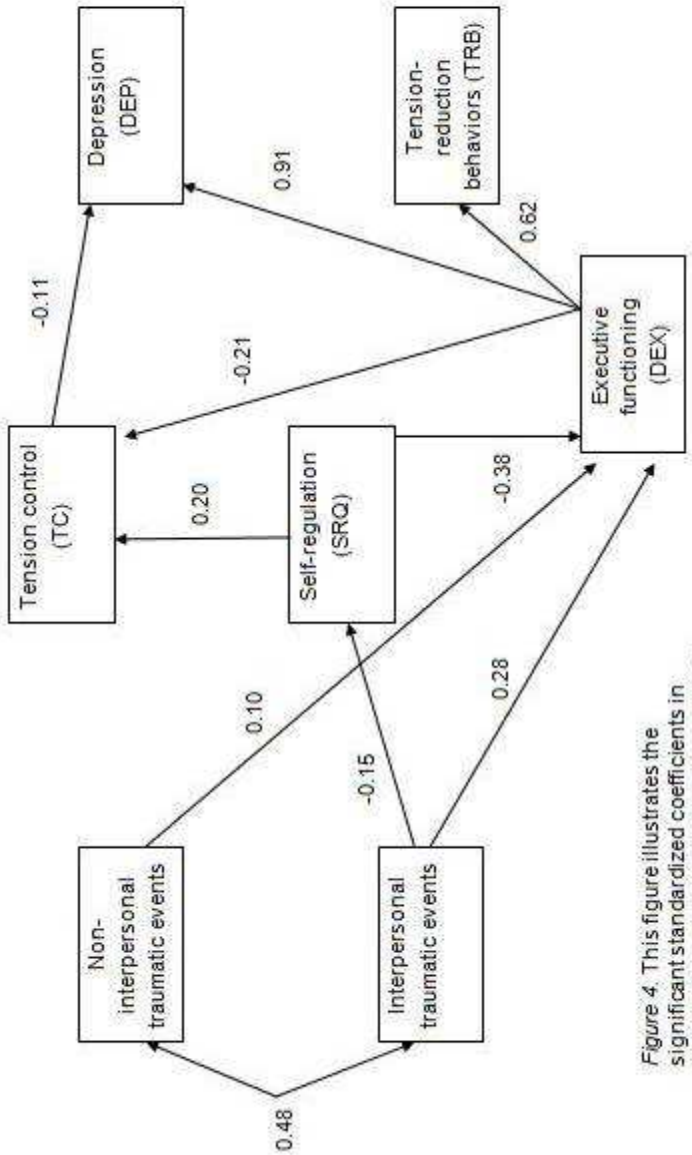

Figure 4. This figure illustrates the significant standardized coefficients in Model 4: Tension Control scale as coping resources variable.

Model 5. To test the hypothesis that the variable Tension Control was not better accounted for by the Mental Tension Control subscale, a fifth, alternative model was analyzed (see Figure 5). The model fit was nearly identical to the fit of Model 4 (see Table 4 for measures of fit); however, it did not provide a better fit, and Model 4 was a more parsimonious model.

The Akaike information criterion (AIC) was computed for Models 3, 4, and 5. This fit index combined estimation and model selection under a single conceptual framework and is also considered a parsimony-adjusted index because it favors simpler models (Kline, 2005). Also, this fit index is generally used to select among competing nonhierarchical models estimated with the same data (Kline, 2005). In other words, the model with the smallest AIC value would be chosen as the model most likely to replicate. The model with the smallest AIC value would be the model with relatively better fit and fewer parameters as compared to any other competing models. The AIC value for Model 3 (CRIS-SF) was 58.44, Model 4 (Tension Control) was 56.46, and Model 5 (Mental Tension Control) was 56.51. Therefore, Model 4 (i.e., Tension Control) provided the best and most parsimonious model. For the remainder of this discussion, the final model will refer to Model 4, the final post-hoc model.

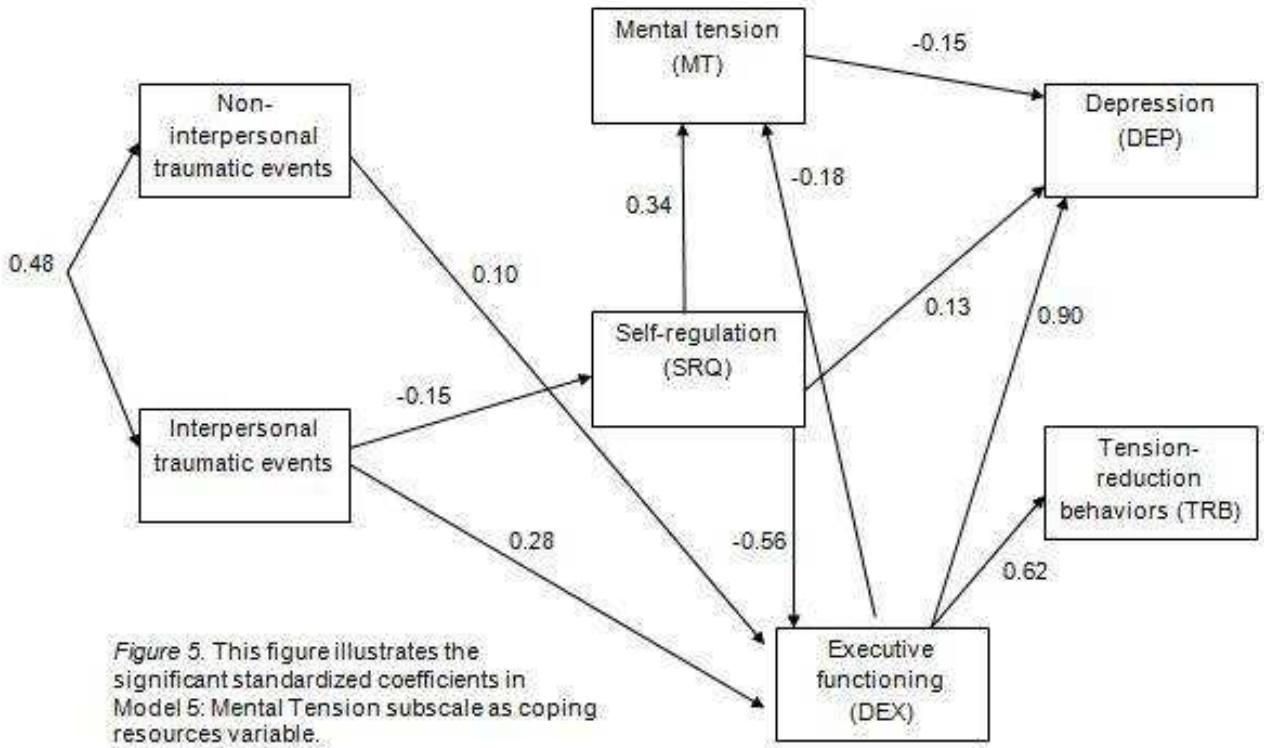

Figure 5. This figure illustrates the significant standardized coefficients in Model 5: Mental Tension subscale as coping resources variable.

Discussion

This study was the first to test the mediating role of coping resources, self-regulation, and executive functioning between traumatic experiences and resulting trauma-related symptoms. These data suggest that there is a complex pattern of relationships between the aforementioned variables. The roles played by executive functioning and self-regulation were not surprising based on previous literature examining the relationship between trauma and self-regulation; however, the decreased role from the variable coping resources was somewhat surprising since previous literature noted the importance of coping resources in the experience of trauma.

It was expected that the experience of a traumatic event (either interpersonal or non-interpersonal) would directly result in a significant amount of symptomatology compared to individuals who had not experienced a traumatic event. Contrary to expectations, experiencing a traumatic event did not directly result in symptoms (i.e., depression or tension-reduction behaviors). Also, the improved fit of the final post-hoc model (i.e., Model 4) indicated that resulting trauma-related symptoms were fully mediated by self-regulation and executive functioning.

The lack of direct relationship between experiencing a traumatic event and resulting symptomatology was surprising. Previous literature noted the existence of a relationship between trauma and related symptoms (Briere & Elliott, 2000). Some trauma-related responses include mood disturbances such as anxiety, depression, anger (Heim & Nemeroff, 2001; Putnam, 2003), and tension reduction activities (Brennan & Shaver, 1995). The current study did indeed demonstrate a positive relationship between trauma and related symptoms (i.e., depression and tension-reduction behaviors), as these

variables were significantly correlated. However, when simultaneously considering other mediating variables (i.e., self-regulation, executive functioning, and tension control), a direct relationship between trauma and related symptoms ceased to exist. This suggested that after experiencing a trauma, the mediating variables (i.e., self-regulation, executive functioning, and tension control) affected the level of resulting symptoms. Previous research had not examined direct relationships between these variables (i.e., trauma and symptoms) while also taking potential mediating variables into consideration.

Furthermore, the current study did not assess PTSD or consider whether participants' report of trauma met criterion for PTSD. Discrepant with previous literature (e.g., see Friedman, 2009) anxiety-related symptoms were not related to experiencing a trauma in the current study. However, consistent with previous literature (e.g., Brennan & Shaver, 1995; Putnam, 2003) depression and tension-reduction behaviors were related to experiencing a trauma. This suggests that traditional symptoms related to PTSD (e.g., anxiety-related responses) may not be applicable to all individuals who experience trauma. The disparity in symptoms that are experienced may provide further evidence for a separate and necessary diagnosis for those individuals who experience trauma but who may not fit the classic PTSD diagnosis (Courtois & Ford, 2009).

The sample of participants in the current study reported experiencing a rather high level of traumatic experiences, even when compared to a general population. Previous research indicated that as many as 39% to 75% of people in the general population had experienced at least one major traumatic stressor in their lifetime (Kessler et al., 1995), while rates found in college students ranged from 36% to 69% (Resnick et al., 1993). The current study suggested that overall, 95% of participants experienced an

interpersonal trauma, a non-interpersonal trauma, or a combination of both types of trauma. Furthermore, on average, participants experienced between 2 to 4 traumatic events. As indicated by Briere and Spinazzola (2009), symptomatology that is caused by accumulated trauma may involve different levels of complexity, depending on the nature, number, and timing of the specific traumas. Therefore, it is possible that the final post-hoc model is reflective of the aforementioned complexity that could occur as a result of multiple traumas or complex trauma (e.g., Ford & Courtois, 2009; Herman, 1992). In other words, an individual who experienced a single non-interpersonal trauma may not experience the same difficulty with self-regulation or executive functioning as an individual who experienced repeated interpersonal trauma.

It should be noted that the current study focused on mediation, rather than moderation. The variables, self-regulation, executive functioning, and coping resources were treated as mediator variables, rather than moderating variables. Extant literature suggested a relationship between trauma and symptomatology (e.g., Briere & Elliott, 2000; Putnam, 2003). Therefore, it was considered that these variables would affect the degree of the existing relationship, rather than re-direct the relationship. However, based on the tested models, there was no direct relationship between trauma and symptoms, thus resulting in self-regulation, executive functioning, and coping resources functioning as mediator variables.

Coping resources indirectly mediated the relationship between experiencing a traumatic event and resulting symptomatology, as there was no direct relationship between experiencing a traumatic event and coping resources. Previous literature indicated the utility of coping resources in the context of traumatic stress (Pietrzak et al.,

2009). Furthermore, it was suggested that by increasing coping resources, the effects of a traumatic event may be decreased (Wheaton, 1983). The decreased role of coping resources is reasonable, as trauma and its effects is a complex and multifaceted process. The process itself would be oversimplified if coping resources were the sole mediator between trauma exposure and resulting symptomatology.

The idea that coping may be closely related to self-regulation was first posited by Lazarus and Folkman (1984), and this theory was fully supported by Matheny et al. (1993). The current model supported this hypothesis, as data indicated significant direct relationships from self-regulation to coping resources (i.e., tension control) and from executive functioning to coping resources. While these variables (i.e., self-regulation, tension control, executive functioning) were significantly correlated, they were not correlated at such a high level as to indicate multicollinearity (Kline, 2005). Identifying and building on adaptive coping strategies has been successful in family systems trauma therapy (Ford & Saltzman, 2009). Therefore, it is likely that efficient coping is a mechanism that is inseparable from the self-regulation and executive functioning systems. In fact, to some extent, self-regulation and executive functioning may even dictate an individual's ability to cope.

Self-regulation mediated the relationship between interpersonal trauma and executive functioning, which in turn, affected depression and tension-reduction behaviors. The inability to regulate emotion has been closely linked to traumatic event exposure (Koenen, 2006), specifically in relation to the etiology of PTSD. While it is typically stated that self-regulation is controlled by executive functioning (Thompson & Goodman, 2010), the current model suggests that self-regulation affects executive

functioning. This is entirely plausible, as self-regulation and executive functioning are both part of the body and brain's stress response system (Ford, 2009). It is quite likely that these two divisions reciprocate and collaborate within the whole stress response system.

Furthermore, self-regulation mediated the relationship between interpersonal trauma and coping resources. As previously mentioned, self-regulation may account for the employment (or lack thereof) of coping resources. Interestingly, there were not any direct or indirect relationships between non-interpersonal trauma and self-regulation. This idea is supported by previous research on complex trauma (e.g., Briere & Spinazzola, 2009; Ford & Courtois, 2009). With repeated (and/or pervasive) trauma, a broad range of symptoms are usually experienced, such as affect regulation, relational problems, and generally, more severe and complex psychological reactions (Briere & Spinazzola, 2009). While it is possible that non-interpersonal trauma may affect self-regulation, typically repeated or pervasive trauma tend to be of interpersonal in nature (van der Kolk et al., 2005). Due to the complexity of repeated trauma and its effects, automatic responses (e.g., self-regulation) may be inhibited. The current model provides further evidence for differences in the effects of non-interpersonal trauma when compared to the effects of interpersonal trauma.

Executive functioning remained as the sole variable to provide a direct pathway between trauma (both non-interpersonal and interpersonal) and resulting symptomatology. This variable also partially mediated relationships between non-interpersonal trauma and coping resources, as well as the relationship between self-regulation and resulting symptomatology. Furthermore, this variable represented the

strongest pathway to both depression and tension-reduction behaviors. That being said, these data suggest that executive functioning plays a critical role, and possibly the most essential role, in the body's response to trauma. Koenen (2006) suggested that executive functioning was a particularly important regulatory system in relation to PTSD. It is likely that the areas of the brain that are involved with executive functioning also regulate a number of systems within the body, including self-regulation. Many neuroimaging studies have noted the importance of the brain in relation to the body's response to trauma or extreme stress (van der Kolk, 2004). While the current study suggests that executive functioning is integral in the dynamic concept of trauma, there remains a considerable lack of understanding about the specific processes that are involved with executive functioning.

Based on these data, as well as implications from previous studies, self-regulation and executive functioning seem to play important roles in the effects of trauma. Given the individualistic nature and variances of self-regulation and executive functioning, the current study may also provide some explanation of individual differences within the trauma response. With respect to practical implications of these findings, intervening at these levels (i.e., self-regulatory processes and executive functions) could be beneficial to individuals who experience trauma. Having an understanding of both the specific symptoms (i.e., depression and tension-reduction behaviors), as well as broad underlying mechanisms would be important. Furthermore, it seems that past research has established a link between experiencing a trauma and resulting symptomatology without considering the function of self-regulation or executive functioning in this context.

Implications

The current study clearly implicates the salient roles of self-regulation and executive functioning within the posttraumatic sequelae. Self-regulation has been previously noted as an important concept when treating trauma (e.g., Briere & Scott, 2006; Herman, 1992); however, in past literature, it seems that the prominent and central roles of self-regulation and executive functioning in the context of trauma may not have been emphasized. Based on the model in this study, it seems that possessing intact self-regulatory and executive functioning processes results in decreased symptomatology. Given this implication, perhaps self-regulatory skills should be taught in a more global manner, since this factor may serve as a protective factor against future distress. Ford and Cloitre (2009) indicate that children need to be able to regulate emotions and impulses in order to manage distress, think clearly, and make choices that optimize the social and academic consequences. Providing all children (and adults) with this training could certainly serve to reduce the future risk of dysregulated emotions and impulses.

Given the findings related to the relationships between trauma and symptomatology, it is important that clinicians differentiate between interpersonal and non-interpersonal trauma. As indicated by Briere and Elliot (2004), it is clear that these two types of trauma result in different effects. In order to assess this, clinicians must complete a thorough and systematic clinical interview (Briere & Spinazzola, 2009). Furthermore, it is essential that clinicians focus on treating the underlying mechanisms of their clients. For example, skills training in affect regulation may aid in increasing self-regulatory behaviors, which in turn, may decrease depressive symptoms. In addition to engaging in these types of interventions, clinicians should consider the ways that self-

regulation, executive functioning, and coping resources interact and attempt to intervene in several of these areas.

There are other treatment considerations for clinicians. The trauma exposure rate in the current sample was extremely high. Since previous studies have noted the similarities in trauma rates between college students and the general population (e.g., Freedy et al., 2002; Resnick et al., 1993) it is likely that trauma exposure rates in the general population are similar to the current sample. This increased level of trauma exposure could result in a large number of individuals seeking services from mental health employees. Clinicians may benefit from having a more generalized view and understanding of trauma. Specifically, some clinicians may focus more on diagnosis (e.g., PTSD), rather than understanding that trauma exposure may result in self-regulatory problems without meeting criteria for PTSD. Also, clinicians should consider that these individuals may be experiencing symptoms other than those symptoms that fit the classic PTSD diagnosis. For example, individuals who experience a trauma may be reporting depressive symptoms or other tension-reduction behaviors such as binge-purge eating, impulsive aggression, and self-mutilation (e.g., Brennan & Shaver, 1995; Zlotnick, Donaldson, Spirito, & Pearlstein, 1997). Treatment for an individual who is experiencing a depressive disorder is markedly different than treatment for an individual who experienced a trauma and is reporting several depressive symptoms.

It is also possible that when treating individuals, clinicians may focus solely on the symptoms themselves (i.e., anxiety, depression, etc.), rather than focusing on increasing self-regulatory capacities. This has been cited as a limitation of behavioral and exposure treatment methods (Follette, Iverson, & Ford, 2009). For example, an individual

may be experiencing sadness as a result of witnessing a death. If a clinician focuses on increasing self-regulation abilities, then that individual may not experience the same degree of symptoms following a future trauma. In other words, by implementing skills training in mindfulness, stress tolerance, and positive interpersonal interactions through a model such as Dialectical Behavior Therapy (DBT; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), the individual will have the capacity to tolerate future trauma and regulate their emotions accordingly. Follette et al. (2009) suggest using contextual behavior trauma therapy (CBTT) to address complex trauma. CBTT focuses on the function of behavior rather than merely the form of behavior, thus addressing the underlying mechanisms (i.e., self-regulation and executive functioning) of the trauma response.

Limitations and Future Research

The current study has a number of limitations that need to be considered when interpreting the results. These data are cross-sectional and based on self-report methods. Longitudinal studies that investigate specific functions of self-regulation and executive functioning would allow for more conclusive statements. Changes in self-regulation and executive functioning likely occur over time, especially as the time from trauma exposure increases.

Also, there are more comprehensive methods for assessing executive functioning by using neuropsychological batteries and tests. The DEX captured a brief glimpse at executive functioning; however, this variable may have been better measured with other assessments. For example, it is possible that using a full administered battery of executive functioning tests such as Wisconsin Card Sorting Test (WCST; Nelson, 1976) or the

Delis-Kaplan Executive Function System (D-KEFS; Delis, Kaplan, Kramer, & Ober, 1997). It is also possible that experiencing trauma could be better assessed. Due to modifications, the ETISR-SF may not have been as valid as the original scale, although there is nothing apparent in the data to suggest this. It should be noted that the item content of the ETISR-SF was not modified; rather, additional questions were added to increase the comprehensiveness of the overall scale.

The current findings warrant further investigation and cross validation in other samples. While the current sample reflected a diverse racial and ethnic population, the proportion of men and women was unequal. It is possible that men and women may experience trauma effects differently. Group differences in the current study were not explored. Since this was the first study to examine all variables of interest collectively, replication of these results are recommended.

Continued exploration of the mechanism by which self-regulation, executive functioning, and coping resources affect depression and tension-reduction behaviors (and other trauma-related symptoms) is warranted. Decomposing these variables into specific functions (e.g., executive functioning into inhibitory processes vs. working memory) may be useful. Further neuroimaging research may be helpful in elucidating the complex neurobiology involved in trauma.

Lastly, it should be reiterated that the current study focused on trauma exposure rather than PTSD. It is possible that replication of the current study with individuals who meet the criteria for PTSD may yield different results. Regardless, future research may benefit from examining trauma (to be differentiated from PTSD), as the current study

seems to suggest that dysfunction may still result for those who do not meet criteria for PTSD and only experience a trauma.

Conclusion

The current study was the first to examine the complex influences of self-regulation, executive functioning, and tension control on the relationship between trauma and resulting symptomatology. The results of the path models revealed that overall, self-regulation, executive functioning, and tension control were important mediating variables in the relation between trauma and resulting symptoms (e.g., depression and tension-reduction behaviors). In particular, the importance of intact self-regulatory and executive functioning behaviors was noted within an individual's trauma response. Also, the differentiation between PTSD and experiencing a traumatic event was emphasized, and the current results suggested a need for future research to focus on clarifying these processes even further.

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APPENDIXES

APPENDIX A

General Research Announcement

My name is Rebecca Blood, and I am currently a doctoral student in the Counseling Psychology program at Georgia State University. I am collecting data for my dissertation, which is examining the effects of experiencing traumatic events. I would like to invite you to participate in this study. You are eligible to participate in this study if you are 18 years old and a college undergraduate at Georgia State University. If you are interested in participating, you will be asked to complete a one-time, online survey. It will take you approximately 45 minutes to complete the entire survey. For your participation, you will receive 5 extra credit points.

Please click on the following link if you are interested in participating: www.surveymonkey.com/INSERTSTUDY. If you have any questions, comments, or concerns about this study, please contact me at rblood1@student.gsu.edu. You may also contact my advisor, Dr. Greg Brack, at gbrack@gsu.edu.

Sincerely,

Rebecca A.C. Blood, M.A.
Counseling Psychology Doctoral Student
Department of Counseling and Psychological Services
Georgia State University

APPENDIX B

Georgia State University
Department of Counseling & Psychological Services
Informed Consent

Title: Examining the effects of traumatic event experiences

Principal Investigator: Gregory L. Brack, Ph.D.
Principal Student Investigator: Rebecca A.C. Blood, M.A.

I. Purpose:

You are invited to participate in a research study examining the effects of experiencing traumatic events. A total of 200 participants will be in this study. Participation in this study will take approximately 45 minutes of your time on one occasion.

II. Procedures:

If you choose to participate in this study, you will complete one online survey. The survey will take approximately 45 minutes to finish. You may choose to complete the survey at any time. You will not need to interact with anyone while taking this survey. However, if you feel upset, you may go to the Counseling and Testing Center at Georgia State University located in the Citizens Trust Building. Alternatively, if you feel upset, you may seek counseling from free or other low-cost mental health professionals.

III. Risks:

There is a chance that by participating in this study you may become upset. If you begin to feel upset, you may stop taking the survey. If you decide to stop taking the survey, you will be given a list of free or low-cost mental health referrals. You will also be reminded of the hours and location of the Georgia State University's Counseling and Testing Center, at which you have free access.

IV. Benefits:

Your participation in this study may benefit you. Research has demonstrated that some people experience relief and better mood after sharing upsetting experiences. Also, your participation in this study will hopefully help us better understand the effects of trauma. This may help mental health professionals in their provision of services to individuals who have experienced trauma.

V. Voluntary Participation and Withdrawal:
Participation in this study is voluntary. You are not required to be in this study. You may drop out at any time if you change your mind or if you become upset. You may skip questions or stop taking the survey at any time.

VI. Confidentiality:

To the extent allowed by law, we will keep your records private. Gregory L. Brack, Ph.D. and Rebecca A.C. Blood, M.A. will have access to the information that you provide. Information may also be shared with those who ensure the study is done correctly (GSU Institutional Review Board and the Office for Human Research Protection (OHRP). Since this online survey is confidential, we will be using encryption of all data and will not be collecting IP addresses. Before you begin the study you will enter your name to sign this informed consent form. This information will be kept entirely separate from the rest of the study. It will be saved in a separate file and your name will not be associated with your answers to the survey questions. All data will be stored on a password and firewall-protected computer. Any identifying information will not appear when we present this study or publish the results. All findings will be summarized and reported in group form.

VII. Georgia State University Disclaimer:

If you have any questions about this study or believe you have suffered any injury because of participation in the study, you may contact Gregory L. Brack at (404) 413-8165. If you get upset you may seek emergency services at Georgia State University's Counseling and Testing Center between the hours of 9 a.m. and 5 p.m. on Monday, Thursday, and Friday, and between the hours of 9 a.m. and 8:00 p.m. on Tuesday and Wednesday. You will also be provided with other free or low-cost mental health referrals. Georgia State University has not set aside funds to pay for this care or to compensate you if something should occur.

VIII. Contact Persons:

Contact Gregory L. Brack, Ph.D. (404-413-8165; gbrack@gsu.edu) or Rebecca A.C. Blood, M.A. (404-413-8165; rblood1@student.gsu.edu) if you have any questions about this study. If you have any questions or concerns about your rights as a participant in this research study, you may contact Susan Vogtner in the Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu.

VIII. Copy of Consent Form to Subject:

You may print a copy of this consent form to keep.

If you agree to participate in this research study, please press the "Next Page" button.

APPENDIX C

Low Cost Referral Services

- Georgia State University Counseling and Testing Center
  75 Piedmont Ave., NE, Suite 200A
  (404) 413-1640

- Georgia State University Psychology Clinic
  www2.gsu.edu
  Urban Life, 11th floor
  140 Decatur Street
  Atlanta. GA 30303-3083
  (404) 413-6229

- Emory University Psychological Clinic
  Department of Psychology
  Suite 270
  36 Eagle Row
  Emory University
  Atlanta, GA 30322
  404-727-7451

- Grady Walk-In Emergency Clinic
  (404) 616-4762
  Open 24 hours

24 hour mental health crisis line at **800-715-4225**

APPENDIX D

Demographics Form

1. Please indicate your age:

2. Please indicate your gender: Male
   Female
   Transgender

3. Please circle the racial/ethnic group with which you identify
   a. Asian/Pacific Islander, Please specify - _____
   b. Black/African American, Please specify _____
   c. Caucasian/White/European American, Please specify _____
   d. East Indian, Please specify _____
   e. Hispanic/Latina, Please specify _____
   f. Middle Eastern, Please specify _____
   g. Multiracial/ethnic, Please specify _____
   h. Native American/American Indian, Please specify _____
   i. Other, Please specify _____

4. Please indicate your spiritual/religious affiliation (if applicable)
   a. Agnostic
   b. Atheist
   c. Buddhist/Taoist
   d. Christian/Catholic
   e. Christian/Protestant
   f. Christian/Other

g. Hindu
h. Jewish
i. Muslim/Islam
j. Spiritual, but not religious
k. Wiccan/Pagan/Neo-Pagan, Please specify_____
l. Other, Please specify _____

5. Please indicate your sexual orientation:
   a. Lesbian/gay
   b. Straight/heterosexual
   c. Bisexual
   d. Pan-sexual/omni-sexual
   e. Other, Please specify_____

6. Please indicate your year in school:
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior

7. Please estimate your GPA: ____

8. Please indicate your marital status:
   a. Single
   b. In a monogamous dating relationship (i.e., dating only one person)
   c. In a non-monogamous dating relationship (i.e., dating more than one person)
   d. Married/Partnered
   e. Married/Partnered, but separated
   f. Divorced

9. Do you identify as an individual who has a disability (e.g., deaf, physical disability, etc.)
   a. Yes
   Please specify _____
   b. No

10. Please indicate your socioeconomic status (SES):
   a. Low income

b. Working class
c. Middle class
d. Wealthy